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ABSTRACT

This instructor's guide consists of materials for use in helping students enrolled in postsecondary vocational or technical education programs to master pretechnical mathematics skills. Addressed in the 17 units of the guide are arranged under the following headings: Whole Numbers (whole number notation; addition, subtraction, multiplication, and division of whole numbers; mixed computation of whole numbers; and estimation of whole numbers); Fractions (fraction notation, addition and subtraction of fractions, and mixed addition and subtraction of fractions); and Decimals (decimal notation; addition, subtraction, multiplication, and division of decimals; and mixed computation of decimals). Each unit contains some or all of the following components: a unit objective, specific performance objectives, suggested activities for the instroctor, a list of references, information sheets, transparency masters, assignment sheets, a test evaluation, and test answers. (MN)

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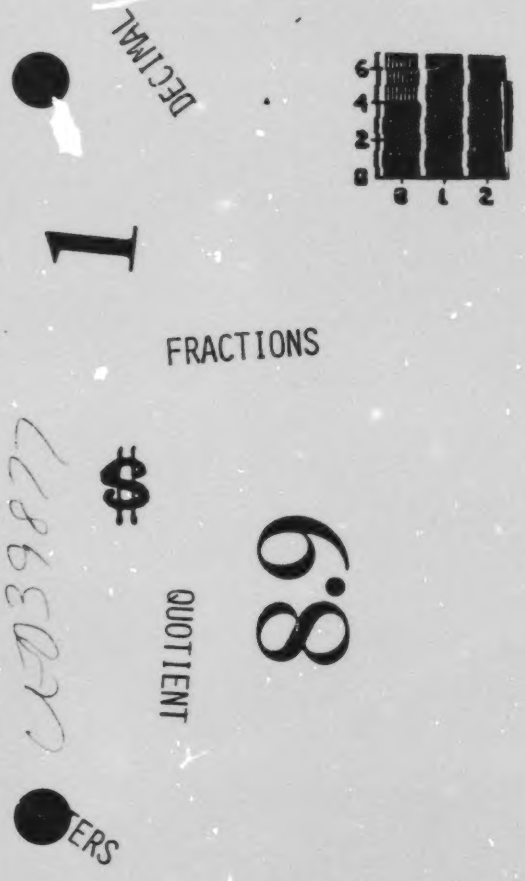
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PRE-TECH MATHEMATICS

Instructor Edition

POST-SECONDARY
VOCATIONAL-TECHNICAL LEVEL

AREA OF VOCATIONAL EDUCATION
COLLEGE OF EDUCATION
UNIVERSITY OF ARKANSAS
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PRE-TECH MATHEMATICS

by

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Developed at the
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This guide was developed from a study of mathematical competencies needed by all post-secondary vocational-technical school students. Study participants included all directors, assistant directors of instruction, and mathematics instructors in the Arkansas vocational-technical schools. Graduates, craft advisory council members, and program instructors from six vocational-technical schools also participated.

Black River
Northwest
Pines
Pulaski
Rich Mountain
White River

Recognition and gratitude are extended to the Mathematics Task Force, who worked diligently to develop this guide.

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USE OF PUBLICATION

Instructional Units

Pre-Tech Math contains 17 units. Each instructional unit includes some or all of the basic components of a unit of instruction: performance objectives, suggested activities for teachers, information sheets, assignment sheets, visual aids, tests and answers to the tests. Units are planned for more than one lesson or class period of instruction.

Careful study of each instructional unit by the teacher will help to determine:

A. The amount of material that can be covered in each class period

B. The skills which must be demonstrated
   1. Supplies needed
   2. Equipment needed
   3. Amount of practice needed
   4. Amount of class time needed for demonstrations

C. Supplementary materials such as pamphlets or filmstrips that must be ordered

D. Resource people who must be contacted

Objectives

Each unit of instruction is based on performance objectives. These objectives state the goals of the course, thus providing a sense of direction and accomplishment for the student.

Performance objectives are stated in two forms: unit objectives, stating the subject matter to be covered in a unit of instruction; and specific objectives, stating the student performance necessary to reach the unit objective.

Since the objectives of the unit provide direction for the teaching-learning process, it is important for the teacher and students to have a common understanding of the intent of the objectives. A limited number of performance terms have been used in the objectives for this curriculum to assist in promoting the effectiveness of the communication among all individuals using the materials.

Reading of the objectives by the student should be followed by a class discussion to answer any questions concerning performance requirements for each instructional unit.

Teachers should feel free to add objectives which will fit the materials to the needs of the students and community. When teachers add objectives, they should remember to supply the needed information, assignment and/or job sheets, and criterion tests.

Suggested Activities for the Instructors

Each unit of instruction has a suggested activities sheet outlining steps to follow in accomplishing specific objectives. Duties of instructors will vary according to the particular unit; however, for best use of the material they should include the following: provide students with objective sheet, information sheet, and assignment sheets; make transparencies and arrange for resource materials and people; discuss unit and specific objectives and information sheet; give test. Teachers are encouraged to use any additional instructional activities and teaching methods to aid students in accomplishing the objectives.

Information Sheets

Information sheets provide content essential for meeting the cognitive (knowledge) objectives in the unit. The teacher will find that the information sheets serve as an excellent guide for presenting the background knowledge necessary to develop the skill specified in the unit objective.

Students should read the information sheets before the information is discussed in class. Students may take additional notes on the information sheets.

Transparency Masters

Transparency masters provide information in a special way. The students may see as well as hear the materials being presented, thus reinforcing the learning process. Transparencies may present new information or they may reinforce information presented in the information sheets. They are particularly effective when identification is necessary.

Transparencies should be made and placed in the notebook where they will be immediately available for use. Transparencies direct the class's attention to the topic of discussion. They should be left on the screen only when topics shown are under discussion.

Assignment Sheets

Assignment sheets give direction to study and furnish practice for paper and pencil activities to develop the techniques which are necessary prerequisites to skill development. These may be given to the student for completion in class or used for homework assignments. Answer sheets are provided which may be used by the student and/or teacher for checking student progress.

Test Evaluation

Paper-pencil and performance tests have been constructed to measure student achievement of each objective listed in the unit of instruction. Individual test items may be pulled out and used as a short test to determine student achievement of a particular objective. This kind of testing may be used as a daily quiz and will help the teacher spot difficulties being encountered by students in their efforts to accomplish the unit objective. Test items for objectives added by the teacher should be constructed and added to the test.

Test Answers

Test answers are provided for each unit. These may be used by the teacher and/or student for checking student achievement of the objectives.

WHOLE NUMBER NOTATION
UNIT I

UNIT OBJECTIVE

After completion of this unit, the student will be able to interpret whole number notation and place given numbers in order. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by successfully scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit of instruction, the student will be able to:

1. Identify the place value of whole numbers to ten places.
2. Read any whole number to ten places.
3. Write any whole number to ten places.
4. Arrange in order any three numbers less than 1,000,000,000.

WHOLE NUMBER NOTATION
UNIT I

SUGGESTED ACTIVITIES

I. Make transparency.

II. Provide student with objective sheet.

III. Provide student with information and assignment sheets.

IV. Discuss unit and specific objectives.

V. Discuss information and assignment sheets.

VI. Illustrate notation system with transparency master.

VII. Assist students as they work through assignment sheets

VIII. Give test.

IX. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

- A. Objective sheet
- B. Informations sheet
- C. Transparency master--Place values name chart
- D. Assignment sheets-
  - 1. Assignment Sheet #1--Identify place value names
  - 2. Assignment Sheet #2--Identify place values of whole numbers
  - 3. Assignment Sheet #3--Write any number to 10 digits
  - 4. Assignment Sheet #4--Arrange in order any 3 numbers less than 10,000
- E. Answers to assignment sheets
- F. Test
- G. Answers to test

II. References:

A. Shea, James T. Basic Essentials of Math, Part I, 2nd Ed. Austin, TX 78768: Steck-Vaughn Co., 1980.

B. O'Neil, Michael J. Guidebook to Mathematics. Los Angeles, CA 90039: Bowmar/Noble Publisher, Inc., 1982.

WHOLE NUMBER NOTATION
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    4. Assignment Sheet #4--Arrange in order any 3 numbers less than 10,000
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WHOLE NUMBER NOTATION
UNIT I

INFORMATION SHEET

I. Terms and Definitions

A. Digit--Any numerical symbol from 0 to 9, originally called digits because they can be counted on the fingers

B. Number--One or more digits, used to show how many, for example, 5, or which one in a series, for example, 5th

C. Numeral--Symbols expressing a number

D. Face Value--The value the digit actually says

E. Place Value--The value or meaning of a digit based on its position or place in a numeral

F. Place Holder--A zero used to hold a place if there is no other digit occupying that place

G. Comma--The symbol (,) used to mark numerals into groups of three

II. Word forms of Numerals

A. zero--0

B. one--1

C. two--2

D. three--3

E. four--4

F. five--5

G. six--6

H. seven--7

I. eight--8

J. nine--9

K. ten--10

L. eleven--11

M. twelve--12

N. thirteen--13

O. fourteen--14

P. fifteen--15

Q. sixteen--16

R. seventeen--17

S. eighteen--18

T. nineteen--19

U. twenty--20

(NOTE: Hyphenate word forms from twenty-one--21 through ninety-nine--99.)

V. thirty--30

W. fourty--40

X. fifty--50

Y. sixty--60

Z. seventy--70

AA. eighty--80

BB. ninety--90

CC. hundred--100

DD. thousand--1,000

EE. million--1,000,000

FF. billion--1,000,000,000

III. Place Value

A.

billions	hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
___,	___	___	___,	___	___	___,	___	___	___

(NOTE: Place value may be expressed as powers of 10.)

B. To find the value of a digit

1. Name the place value of the digit.

2. Multiply the digit by its place value.

Example:

To find the value of 5 in 2,851

1. Name the place value of 5; in this case, the tens place.

2. Multiply 5 by the place name; in this case, 5 times 10 or 50

IV. Read whole numbers to 10 places

Billions ,			Millions ,			Thousands ,			Ones		
hundreds	tens	ones	hundreds	tens	ones	hundreds	tens	ones	hundreds	tens	ones

A. Starting from right to left, separate by use of commas every 3 digits.

Example 23,106

B. From left to right, determine the group name of the 1st group.

Example: In 23,106, the first group reads thousand.

C. Read tht number followed by its group name; repeat the process for each group.

Example: 23,106 reads twenty-three thousand, one hundred six.

V. Write whole number to 10 places

A. Express a given numberal in word form

1. Divide the numbers from right to left into groups of threes.

2. Determine the group name of the extreme left group.

Example: In 632,504,982, the extreme left group reads millions; the next group reads thousands, the last group reads hundreds, tens and ones.

3. Write the word names for each group followed by the group name;repeat for each group, moving to the right.

Example: 632,504,982 written as six hundred thirty-two million, five hundred four thousand, nine hundred eighty-two.

(NOTE: Hyphenate numbers from 21 through 99. Insert commas after each group name.)

B. Express the word form of a number in its numerical form

1. Read the word forms of numbers.

Example: Twenty-six thousand, five hundred fifty.

2. Write the numerical form, separating each group by a comma.

Example: 26,550

(NOTE: Each place value not represented must have a zero as place holder.)

VI. Ordering--The value of a digit depends upon its place value position in a number. Each movement to the left increases the place of the number.

(NOTE: 30 is larger than 5, because the 3 is in the ten position and the 10's position is to the left of the one's position.)

WHOLE NUMBER NOTATION
UNIT I

ASSIGNMENT SHEET #1--IDENTIFY THE PLACE VALUE NAME

Directions: Fill in the place value names in the chart listed below:

			millions						ones		
		ones				hundreds				tens	

WHOLE NUMBER NOTATION
UNIT I

ASSIGNMENT SHEET #2--IDENTIFY PLACE VALUE OF WHOLE NUMBERS

Directions: Fill in spaces with digits in given numbers. Write each digit in its correct place of value.

1. one billion, seven hundred million

2. two billion, eight hundred sixty-two million, four thousand, three hundred

3. nine hundred five million, one hundred thirteen thousand, four

4. six billion, four hundred sixty-four million, five hundred thousand, one

Billions			Millions			Thousands			Ones		
hundreds	tens	ones	hundreds	tens	ones	hundreds	tens	ones	hundreds	tens	ones

1. ____________________

2. ____________________

3. ____________________

4. ____________________

WHOLE NUMBER NOTATION
UNIT I

ASSIGNMENT SHEET #3--WRITE ANY SMALL NUMBER TO 10 DIGITS

Directions: In the problems below, write numbers which mean the same as the words.

Example: Two billion, eight hundred sixty-two million, four thousand, three hundred ____2,862,004,300____

1. five billion, three million, four hundred thousand, five hundred two ______________________

2. seventy-five million, six thousand, three hundred
____

3. five hundred three million, five hundred seventeen
____

4. two billion, eighty ______________________

5. five billion, three million, two thousand, one
____

WHOLE NUMBER NOTATION
UNIT I

ASSIGNMENT SHEET #4--ARRANGE IN ORDER ANY 3 NUMBERS LESS THAN 10,000

Directions: Write each of the following sets of numbers in order, starting with the smallest numbers and ending with the largest number.

1. a. 7,562 ______________
   b. 7,062 ______________
   c. 3,792 ______________

2. a. 702 ______________
   b. 792 ______________
   c. 733 ______________

3. a. 4,962 ______________
   b. 9,402 ______________
   c. 9,500 ______________

4. a. 9,234 ______________
   b. 9,099 ______________
   c. 9,999 ______________

5. a. 560 ______________
   b. 506 ______________
   c. 605 ______________

6. a. 1,000 ______________
   b. 1,101 ______________
   c. 1,011 ______________

WHOLE NUMBER NOTATION
UNIT I

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

billions			millions			thousands			ones		
hundreds	tens	ones	hundreds	tens	ones	hundreds	tens	ones	hundreds	tens	ones

ASSIGNMENT SHEET #2

1. 1,700,000,000
2. 2,862,004,300
3. 905,113,004
4. 6,464,500,001

ASSIGNMENT SHEET #3

1. 5,003,400,502
2. 75,006,300
3. 503,000,517
4. 2,000,000,080
5. 5,003,002,001

ASSIGNMENT SHEET #4

1. a. 3,792
   b. 7,062
   c. 7,562

2. a. 702
   b. 733
   c. 792

3. a. 4,962
   b. 9,402
   c. 9,500

4. a. 9,099
   b. 9,234
   c. 9,999

5. a. 506
   b. 560
   c. 605

6. a. 1,000
   b. 1,011
   c. 1,101

WHOLE NUMBER NOTATION
UNIT I

TEST

1. On the vertical lines above, write the correct place value name.

2. Write in words the following numbers

   a. 5,642,319 ______________________________

   ____

   b. 47,940,620 ______________________________

   ____

   c. 5,001 ______________________________

   ____

   d. 7,834,670,120 ______________________________

   ____

3. Write the following word numbers using numerals 1,2,3...

   a. Five million, three hundred thousand, twenty-one.

   ____

   b. Four hundred five thousand, two hundred three.

   ____

c. Two billion, four hundred five million, five hundred three thousand, nine hundred ninety-nine.

____

4. Arrange each of the following sets of numbers in order, starting with the smallest numbers and ending with the largest number.

a. 9506 ________________

9560 ________________

9056 ________________

b. 310 ________________

301 ________________

321 ________________

c. 1,999,999 ____________________

1,099,999 ____________________

2,000,000 ____________________

d. 5001 ________________

5100 ________________

5010 ________________

WHOLE NUMBER NOTATION
UNIT I

ANSWERS TO UNIT TEST I

1.

billions	hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones or units

2. a. five million, six hundred forty-two thousand, three hundred nineteen.

b. forty-seven million, nine hundred forty thousand, six hundred twenty.

c. five thousand, one.

d. seven billion, eight hundred thirty-four million, six hundred seventy thousand, one hundred twenty.

3. a. 5,300,021

b. 405,203

c. 2,405,503,999

4. a. 9,056
9,506
9,560

b. 301
310
321

c. 1,099,999
1,999,999
2,000,000

d. 5,000
5,010
5,100

ADDITION OF WHOLE NUMBERS
UNIT II

UNIT OBJECTIVE

After completion of this unit, the student should be able to add whole numbers. This will be evidenced by correctly performing the procedures outlined in the assignment sheets and by scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Add columns of whole numbers with one digit.
2. Add columns of whole numbers with more than one digit.
3. Add whole numbers involving carrying.

ADDITION OF WHOLE NUMBERS
UNIT II

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

  A. Objective sheet

  B. Information sheet

  C. Assignment sheets-

    1. Assignment Sheet #1--Add columns of whole numbers with one digit.

    2. Assignment Sheet #2--Add columns of whole numbers with more than one digit.

    3. Assignment Sheet #3--Add whole numbers involving carrying.

  D. Answers to assignment sheets

  E. Test

  F. Answers to test

II. References:

A. Shea, James T. Basic Essentials of Math, Part I, 2nd Ed. Austin, TX 78768: Steck-Vaughn Co., 1980.

B. O'Neil, Michael J. Guidebook to Mathematics. Los Angeles, CA 90039: Bowmar/Noble Publisher, Inc., 1982.

ADDITION OF WHOLE NUMBERS
UNIT II

INFORMATION SHEET

I. Terms and Definitions

A. Addition--The process of combining numbers together, commonly designated by plus sign, +

B. Addends--Numbers that are added together

C. Sum or total--The answer to an addition problem

Example:

$$\begin{array}{lrl} & 2 & \text{addends} \\ \text{addition} & +3 & \text{addends} \\ \cline{2-2} \text{sign} & 5 & \text{sum} \end{array}$$

D. Number of digits

1. One-digit is when one symbol is used

Example:

$$\begin{array}{r} 1 \\ +1 \\ \hline 2 \end{array}$$

2. Two-digit is when two symbols are used

Example:

$$\begin{array}{r} 22 \\ +22 \\ \hline 44 \end{array}$$

3. Three-digit is when three symbols are used

Example;

$$\begin{array}{r} 111 \\ +222 \\ \hline 333 \end{array}$$

E. Carrying--The movement of the first digit of a number greater than 9 to the next column to the left

Example:

$$\begin{array}{r} 9 \\ +3 \\ \hline 12 \end{array}$$

INFORMATION SHEET

II. Addition

A. Write the numbers one directly under another with the place value columns in a straight line by putting the ones under the ones, the tens under the tens, and the hundreds under the hundreds, etc.

Example: To add 33 and 106, line the numbers

$$\begin{array}{r} 33 \\ +106 \\ \hline \end{array}$$

B. Add each column starting from the right with the ones column and moving to the left each time.

Example:

$$\begin{array}{r} 33 \\ +106 \\ \hline 139 \end{array}$$

1. Three and 6 are 9
2. Three and 0 are 3
   (NOTE: The addition of zero to any number is the number.)
3. 1 and zero is 1
4. The answer is 139

C. Carry the 1st digit of any number greater than 9 to the next column to the left and add it in that column. Keep any digit of 9 or less in its original column.

Example:

$$\begin{array}{r} 11 \\ 93 \\ +39 \\ \hline 132 \end{array}$$

1. 9 and 3 are 12. Put the 2 in the ones column and carry the 1 ten to the tens column.
2. Add the 9 tens, 3 tens, and the 1 ten you carried for a sum of 13 tens.
3. Put the 3 in the tens column and carry the 1 to the hundreds column.
4. There are no other hundreds, so record the carried 1 hundred in your answer.

ADDITION OF WHOLE NUMBERS
UNIT II

INFORMATION SHEET

I. Terms and Definitions

A. Addition--The process of combining numbers together, commonly designated by plus sign, +

B. Addends--Numbers that are added together

C. Sum or total--The answer to an addition problem

$$\begin{array}{lrl} \text{Example:} & 2 & \text{addends} \\ \text{addition} & +3 & \text{addends} \\ \cline{2-2} \text{sign} & 5 & \text{sum} \end{array}$$

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Example:
$$\begin{array}{r} 1 \\ +1 \\ \hline 2 \end{array}$$

2. Two-digit is when two symbols are used

Example:
$$\begin{array}{r} 22 \\ +22 \\ \hline 44 \end{array}$$

3. Three-digit is when three symbols are used

Example;
$$\begin{array}{r} 111 \\ +222 \\ \hline 333 \end{array}$$

E. Carrying--The movement of the first digit of a number greater than 9 to the next column to the left

Example:
$$\begin{array}{r} 9 \\ +3 \\ \hline 12 \end{array}$$

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+106
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B. Add each column starting from the right with the ones column and moving to the left each time.

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           139
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           132
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2. Add the 9 tens, 3 tens, and the 1 ten you carried for a sum of 13 tens.
3. Put the 3 in the tens column and carry the 1 to the hundreds column.
4. There are no other hundreds, so record the carried 1 hundred in your answer.

ADDITION OF WHOLE NUMBERS
UNIT II

ASSIGNMENT SHEET #1--ADD COLUMNS OF WHOLE NUMBERS WITH ONE DIGIT

Directions: Add the following numbers and record your answer under each problem:

Add:

1.	a) 4	b) 5	c) 8	d) 9	e) 5	f) 3
	3	6	3	8	4	0
	2	4	2	3	6	9
	+5	+2	+1	+2	+3	+4

2.	a) 9	b) 7	c) 6	d) 5	e) 1	f) 7
	1	3	7	4	3	2
	3	8	3	2	6	4
	+4	+2	+5	+6	+2	+3

3.	a) 2	b) 4	c) 6	d) 7	e) 5	f) 3
	1	3	5	2	7	8
	2	3	4	6	5	3
	+5	+6	+1	+3	+5	+6

4.	a) 7	b) 8	c) 5	d) 2	e) 1	f) 3
	4	5	3	3	4	4
	2	3	7	6	8	5
	+7	+8	+3	+7	+3	+3

ADDITION OF WHOLE NUMBERS
UNIT II

ASSIGNMENT SHEET #2--ADD COLUMNS OF WHOLE NUMBERS WITH MORE THAN 1 DIGIT

Directions: Add the following numbers and record your answers.

	a)	b)	c)	d)	e)
1.	34	12	20	10	45
	23	21	23	24	21
	10	32	13	30	10
	+22	+22	+32	+15	+23

	a)	b)	c)	d)	e)
2.	28	22	12	13	14
	30	32	14	31	51
	41	21	21	45	11
	+10	+33	+32	+10	+10

ADDITION OF WHOLE NUMBERS
UNIT II

ASSIGNMENT SHEET #3
ADD WHOLE NUMBERS INVOLVING CARRYING

Directions: Add the following numbers and record your answer.

1.	a)	457 +784	b)	234 +576	c)	789 +482	d)	126 +457	e)	674 +456
2.	a)	234 +918	b)	546 +267	c)	786 +368	d)	568 +568	e)	654 +369
3.	a)	567 +348	b)	356 +456	c)	876 +246	d)	345 +568	e)	234 +983
4.	a)	321 +649	b)	342 +786	c)	654 +437	d)	678 +975	e)	567 +785

ADDITION OF WHOLE NUMBERS
UNIT II

ASSIGNMENT SHEET #3
ADD WHOLE NUMBERS INVOLVING CARRYING

Directions: Add the following numbers and record your answer.

1.	a)	457 +784	b)	234 +576	c)	789 +482	d)	126 +457	e)	674 +456
2.	a)	234 +918	b)	546 +267	c)	786 +368	d)	568 +5[illegible]	e)	654 +369
3.	a)	567 +348	b)	356 +456	c)	876 +246	d)	345 +568	e)	234 +983
4.	a)	321 +649	b)	342 +786	c)	654 +437	d)	678 +975	e)	567 +785

ADDITION OF WHOLE NUMBERS
UNIT II

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

1. a. 14
   b. 17
   c. 14
   d. 22
   e. 18
   f. 16
2. a. 17
   b. 20
   c. 21
   d. 17
   e. 12
   f. 16
3. a. 10
   b. 16
   c. 16
   d. 18
   e. 22
   f. 20
4. a. 20
   b. 24
   c. 18
   d. 18
   e. 16
   f. 15

ASSIGNMENT SHEET #2

1. a. 89
   b. 87
   c. 88
   d. 79
   e. 99
2. a. 109
   b. 108
   c. 79
   d. 99
   e. 86

ASSIGNMENT SHEET #3

1. a. 1,241
   b. 810
   c. 1,271
   d. 583
   e. 1,130
2. a. 1152
   b. 813
   c. 1,154
   d. 1,136
   e. 1,023
3. a. 915
   b. 812
   c. 1,122
   d. 913
   e. 1,217
4. a. 970
   b. 1,128
   c. 1,091
   d. 1,653
   e. 1,352

ADDITION OF WHOLE NUMBERS
UNIT II

TEST

Add:

1.

a.	b.	c.	d.	e.	f.
6	3	7	8	6	7
4	7	9	4	9	3
2	9	8	3	8	4
9	4	4	2	3	6
8	0	3	6	6	5

2.

a.	b.	c.	d.	e.	f.
46	38	45	55	28	40
+32	+50	+32	+43	+31	+19

3.

a.	b.	c.	d.	e.
36	54	638	6283	7839
89	38	925	9462	4203
48	40	426	4113	6379
37	62	942	5039	5892
50	59	659	6048	1019

ADDITION OF WHOLE NUMBERS
UNIT II

TEST

Add:

1.	a.	b.	c.	d.	e.	f.
	6	3	7	8	6	7
	4	7	9	4	9	3
	2	9	8	3	8	4
	9	4	4	2	3	6
	8	0	3	6	6	5

2.	a.	b.	c.	d.	e.	f.
	46	38	45	55	28	40
	+32	+50	+32	+43	+31	+19

3.	a.	b.	c.	d.	e.
	36	54	638	6283	7839
	89	38	925	9462	4203
	48	40	426	4113	6379
	37	62	942	5039	5892
	50	59	659	6048	1019

ADDITION OF WHOLE NUMBERS
UNIT II

ANSWERS TO TEST

1. a. 29; b. 23; c. 31; d. 23; e. 32; f. 25

2. a. 78; b. 88; c. 77; d. 98; e. 59; f. 59

3. a. 260; b. 253; c. 3590; d. 30945; e. 25332

SUBTRACTION OF WHOLE NUMBERS
UNIT III

UNIT OBJECTIVE

After completion of this unit, the student should be able to subtract whole numbers. This will be evidenced by correctly performing the procedures outlined in the assignment sheets and by scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Subtract whole numbers where no borrowing is required.
2. Subtract whole numbers where borrowing is required.
3. Subtract whole numbers involving properties of zero.
4. Check subtraction of whole numbers.

SUBTRACTION OF WHOLE NUMBERS
UNIT III

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

   A. Objective sheet

   B. Information sheet

   C. Assignment sheets-

      1. Assignment Sheet #1--Subtract whole numbers where no borrowing is required.

      2. Assignment Sheet #2--Subract whole numbers where borrowing is required.

      3. Assignment Sheet #3--Subtract whole numbers involving properties of zero.

      4. Assignment Sheet #4--Check subtraction of whole numbers.

   D. Answers to assignment sheets

   E. Test

   F. Answers to test

II. References:

A. Aufman, Richard N. and Vernon C. Barker. Essential Mathematics. Boston, MA 02108: Houghton Mifflin Co., 1982.

B. O'Neil, Michael J. Guidebook to Mathematics. Los Angeles, CA 90039: Bowmar/Noble Publishers, Inc., 1982.

SUBTRACTION OF WHOLE NUMBERS
UNIT III

INFORMATION SHEET

I. Terms and Definitions

A. Subtraction--The process of taking away, commonly designated by the minus sign, -

B. Minuend--The number from which another number is being subtracted

C. Subtrahend--The number which is being subtracted from another

D. Difference--The answer to a subtraction problem

E. Borrowing--The movement of 1 from the digit in the next left column in the minuend when the subtrahend is greater than the minuend

II. Subtraction

A. Write the larger number (minuend) above the smaller number (subtrahend)

Example: 128 minus 15, write $\begin{array}{r} 128 \\ \underline{-15} \end{array}$

B. Subtract each column, starting from the right with the ones column and moving to the left each time

Example: $\begin{array}{r} 128 \\ \underline{-15} \\ 113 \end{array}$

In the ones column,

1. Subtract 5 from 8, leaving 3
2. In the tens column, subtract 1 from 2, leaving 1
3. 0 from 1 leaves 1 in hundreds column

(NOTE: You may check your answer by adding it and the subtrahend. This should result in the minuend.)

INFORMATION SHEET

Example:

$$\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array} \qquad\qquad \begin{array}{r} \text{check} \\ 6 \\ +2 \\ \hline 8 \end{array}$$

1. Subtract 2 from 8, leaving 6

2. Check your answer by adding 6 and 2, resulting in your original number of 8

C. Borrow one (1) from the digit from the next column to the left when the bottom number is greater than the top number

Example:

$$\begin{array}{r} 5 \\ \cancel{6}4 \\ -38 \\ \hline 26 \end{array}$$

1. In the ones column, 8 is larger than 4. Borrow 1 ten from minuend of the tens column, leaving 5. Now add the 1 ten to the 4, resulting in 14.

(NOTE: In the case of borrowing, the top number in the column will hold a number with two digits instead of one.)

2. Subtract 8 from 14, leaving 6

3. In the tens column, subtract 3 from 5, leaving 2

D. Treat the digit zero as any other digit. If it is in the minuend, borrow from the column to its left to subtract. If it is the subtrahend, subtract zero from the minuend.

Examples:

$$\begin{array}{r} 7 \\ \cancel{8}0 \\ -5 \\ \hline 75 \end{array}$$

5 is larger than 0; therefore, borrow 1 ten from the ten column and subtract 5 from 10. The 8 then becomes 7.

$$\begin{array}{r} 85 \\ -20 \\ \hline 65 \end{array}$$

0 is smaller than 5; therefore, 0 subtracted from 5 leaves 5; 2 from 8 leaves 6.

INFORMATION SHEET

$$\begin{array}{r} 79910 \\ \cancel{8}\cancel{0}\cancel{0}0 \\ -9 \\ \hline 7991 \end{array}$$

9 is larger than 0; therefore, there is a need to borrow to solve this problem. In this case, there are 0 tens. Continue to move to the left columns until a digit can be borrowed, in this case, from the thousands column. This leaves 7 thousands and renames the hundreds column as ten hundred. Borrow one digit from the hundreds column leaving 9 hundreds, and renaming the tens column as 10 tens. Next borrow one digit from the tens column, leaving 9 tens and renaming the ones column 10 ones. Now that the minuend has been renamed, the subtrahend can be subtracted from it.

INFORMATION SHEET

$$\begin{array}{r} 79910 \\ \cancel{8}\cancel{0}\cancel{0}0 \\ \underline{-9} \\ 7991 \end{array}$$

9 is larger than 0; therefore, there is a need to borrow to solve this problem. In this case, there are 0 tens. Continue to move to the left columns until a digit can be borrowed, in this case, from the thousands column. This leaves 7 thousands and renames the hundreds column as ten hundred. Borrow one digit from the hundreds column leaving 9 hundreds, and renaming the tens column as 10 tens. Next borrow one digit from the tens column, leaving 9 tens and renaming the ones column 10 ones. Now that the minuend has been renamed, the subtrahend can be subtracted from it.

SUBTRACTION OF WHOLE NUMBERS
UNIT III

ASSIGNMENT SHEET #1--SUBTRACT WHOLE NUMBERS WHERE NO BORROWING IS REQUIRED

Directions: Subtract the following numbers and record your answers.

Subtract:

1.	a) $\begin{array}{r}987\\ \underline{435}\end{array}$	b) $\begin{array}{r}765\\ \underline{321}\end{array}$	c) $\begin{array}{r}465\\ \underline{432}\end{array}$	d) $\begin{array}{r}958\\ \underline{541}\end{array}$	e) $\begin{array}{r}768\\ \underline{325}\end{array}$
2.	a) $\begin{array}{r}576\\ \underline{123}\end{array}$	b) $\begin{array}{r}786\\ \underline{432}\end{array}$	c) $\begin{array}{r}986\\ \underline{564}\end{array}$	d) $\begin{array}{r}785\\ \underline{342}\end{array}$	e) $\begin{array}{r}999\\ \underline{456}\end{array}$
3.	a) $\begin{array}{r}965\\ \underline{643}\end{array}$	b) $\begin{array}{r}436\\ \underline{232}\end{array}$	c) $\begin{array}{r}765\\ \underline{543}\end{array}$	d) $\begin{array}{r}987\\ \underline{542}\end{array}$	e) $\begin{array}{r}678\\ \underline{123}\end{array}$
4.	a) $\begin{array}{r}888\\ \underline{354}\end{array}$	b) $\begin{array}{r}777\\ \underline{435}\end{array}$	c) $\begin{array}{r}345\\ \underline{123}\end{array}$	d) $\begin{array}{r}698\\ \underline{434}\end{array}$	e) $\begin{array}{r}786\\ \underline{534}\end{array}$

SUBTRACTION OF WHOLE NUMBERS
UNIT III

ASSIGNMENT SHEET #2--SUBTRACT WHOLE NUMBERS WHERE BORROWING IS REQUIRED

Directions: Subtract the following problems and record your answers. Borrow where necessary.

1.	a)	789 246	b)	456 268	c)	765 159	d)	763 567	e)	872 655
2.	a)	763 484	b)	564 176	c)	761 459	d)	784 675	e)	994 579
3.	a)	984 867	b)	761 439	c)	755 626	d)	784 236	e)	893 178
4.	a)	871 638	b)	875 599	c)	987 638	d)	657 368	e)	784 595

SUBTRACTION OF WHOLE NUMBERS
UNIT III

ASSIGNMENT SHEET #2--SUBTRACT WHOLE NUMBERS WHERE BORROWING IS REQUIRED

Directions: Subtract the following problems and record your answers. Borrow where necessary.

1.	a)	789	b)	456	c)	765	d)	763	e)	872
		246		268		159		567		655
2.	a)	763	b)	564	c)	761	d)	784	e)	994
		484		176		459		675		579
3.	a)	984	b)	761	c)	755	d)	784	e)	893
		867		439		626		236		178
4.	a)	871	b)	875	c)	987	d)	657	e)	784
		638		599		638		368		595

SUBTRACTION OF WHOLE NUMBERS
UNIT III

ASSIGNMENT SHEET #3--SUBTRACT WHOLE NUMBERS INVOLVING PROPERTIES OF ZERO

Directions: Subtract the following problems and record your answers.

1.	a)	570	b)	406	c)	430	d)	680	e)	450
		468		347		320		499		203
2.	a)	9000	b)	785	c)	761	d)	654	e)	983
		4865		649		604		638		790
3.	a)	800	b)	409	c)	506	d)	760	e)	503
		567		239		349		678		201
4.	a)	872	b)	542	c)	654	d)	764	e)	630
		609		305		509		208		159

SUBTRACTION OF WHOLE NUMBERS
UNIT III

ASSIGNMENT SHEET #4--CHECK SUBTRACTION OF WHOLE NUMBERS

Directions: Subtract the following problems and check the answers.

To check, add the subtrahend and the difference. If the sum of the subtrahend and the difference is the same as the minuend, the difference is correct.

Example:		
	894	Minuend
	-487	Subtrahend
	+407	Difference
	894	Same as minuend

	a)	b)	c)	d)	e)
1.	456 358	786 345	780 654	763 238	541 299
2.	672 458	874 476	9876 6793	6543 5899	4362 3548
3.	876 568	952 468	675 408	894 540	764 453
4.	8904 7045	6741 5349	7895 5468	7632 4538	5283 2105

SUBTRACTION OF WHOLE NUMBERS
UNIT III

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

1. a. 552
   b. 444
   c. 33
   d. 417
   e. 443

2. a. 453
   b. 354
   c. 422
   d. 443
   e. 543

3. a. 322
   b. 204
   c. 222
   d. 445
   e. 555

4. a. 534
   b. 342
   c. 222
   d. 264
   e. 252

ASSIGNMENT SHEET #2

1. a. 543
   b. 188
   c. 506
   d. 196
   e. 217

2. a. 279
   b. 388
   c. 302
   d. 109
   e. 415

3. a. 117
   b. 322
   c. 129
   d. 548
   e. 715

4. a. 233
   b. 276
   c. 349
   d. 289
   e. 189

ASSIGNMENT SHEET #3

1. a. 102
   b. 59
   c. 110
   d. 181
   e. 247

2. a. 4135
   b. 136
   c. 157
   d. 16
   e. 193

3. a. 233
   b. 170
   c. 157
   d. 82
   e. 302

4. a. 263
   b. 237
   c. 145
   d. 556
   e. 471

ASSIGNMENT SHEET #4

1. a. 98
   b. 441
   c. 126
   d. 525
   e. 242

2. a. 214
   b. 398
   c. 3083
   d. 644
   e. 814

3. a. 308
   b. 484
   c. 267
   d. 354
   e. 311

4. a. 1859
   b. 1392
   c. 2427
   d. 3094
   e. 3178

SUBTRACTION OF WHOLE NUMBERS
UNIT III
TEST

1. a. $\begin{array}{r}987\\ \underline{-342}\end{array}$ b. $\begin{array}{r}654\\ \underline{-333}\end{array}$ c. $\begin{array}{r}786\\ \underline{-451}\end{array}$ d. $\begin{array}{r}888\\ \underline{-356}\end{array}$ e. $\begin{array}{r}999\\ \underline{-473}\end{array}$

2. a. $\begin{array}{r}942\\ \underline{-315}\end{array}$ b. $\begin{array}{r}883\\ \underline{-727}\end{array}$ c. $\begin{array}{r}652\\ \underline{-268}\end{array}$ d. $\begin{array}{r}455\\ \underline{-296}\end{array}$ e. $\begin{array}{r}792\\ \underline{-693}\end{array}$

3. a. $\begin{array}{r}960\\ \underline{-346}\end{array}$ b. $\begin{array}{r}842\\ \underline{-109}\end{array}$ c. $\begin{array}{r}604\\ \underline{-493}\end{array}$ d. $\begin{array}{r}500\\ \underline{-492}\end{array}$ e. $\begin{array}{r}6000\\ \underline{-5429}\end{array}$

4. With problems below, show how you checked your answer.

a. $\begin{array}{r}290\\ \underline{-194}\end{array}$ b. $\begin{array}{r}368\\ \underline{-249}\end{array}$ c. $\begin{array}{r}894\\ \underline{-368}\end{array}$ d. $\begin{array}{r}9000\\ \underline{-1890}\end{array}$ e. $\begin{array}{r}9002\\ \underline{-4296}\end{array}$

SUBTRACTION OF WHOLE NUMBERS
UNIT III

ANSWERS TO TEST

1.
   a. 645
   b. 321
   c. 335
   d. 532
   e. 526

2.
   a. 627
   b. 156
   c. 384
   d. 159
   e. 99

3.
   a. 614
   b. 733
   c. 111
   d. 8
   e. 571

4.
   a. 96
   b. 119
   c. 526
   d. 7110
   e. 4706

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

UNIT OBJECTIVE

After completion of this unit, the student should be able to multiply whole numbers. This will be evidenced by correctly performing the procedures outlined in the assignment sheets and by scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Write or recite multiplication of whole numbers through 12.
2. Multiply whole numbers where no carrying is required.
3. Multiply whole numbers where carrying is required.
4. Multiply numbers involving properties of zero.

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

SUGGESTED ACTIVITIES

I. Make transparency.

II. Provide student with objective sheet.

III. Provide student with information and assignment sheets.

IV. Discuss unit and specific objectives.

V. Discuss information and assignment sheets.

VI. Assist students as they work through assignment sheets.

VII. Give test.

VIII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

  A. Objective sheet

  B. Information sheet

  C. Transparency master--Multiplication table

  D. Assignment sheets-

    1. Assignment Sheet #1--Write or recite multiplication of whole numbers through 12.

    2. Assignment Sheet #2--Multiply whole numbers where no carrying is required.

    3. Assignment Sheet #3--Multiply whole numbers where carrying is required.

    4. Assignment Sheet #4--Multiply whole numbers involving the properties of zero.

  E. Answers to assignment sheets

  F. Test

  G. Answers to test

II. References:

A. Aufman, Richard N. and Vernon C. Barker. Essential Mathematics. Boston, MA 02108: Houghton Mifflin Co., 1982.

B. Shea, James T. Working with Numbers. Austin, TX 78768: Steck-Vaughn Co., 1980.

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

INFORMATION SHEET

I. Terms and Definitions

A. Multiplication--The process of adding like numbers quickly, commonly designated by the times sign, x.

B. Factors--Numbers that are multiplied.

Example: $\begin{array}{r} 3 \\ \underline{\text{x}4} \\ 12 \end{array}$ In this problem, 3 and 4 are factors.

C. Product--The answer in a multiplication problem.

Example: $\begin{array}{r} 3 \\ \underline{\text{x}4} \\ 12 \end{array}$ In this problem, 12 is the product.

II. Multiplication Table or Facts

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

(NOTE: It is very important to memorize these multiplication facts to make multiplication easier and faster.)

INFORMATION SHEET

III. Multiplying by numbers ending in 10, 100, 1000, etc.

A. Set up the problem with the number ending in zero(s) on bottom:

Example:
$$\begin{array}{r} 53 \\ \underline{\times 10} \end{array}$$

B. Move from right to left until you come to the digit larger than 0.

C. Multiply the top number by this digit and add the same number of zeros that the bottom number had.

Example:
$$\begin{array}{r} 53 \\ \underline{\times 10} \end{array}$$
1 times 53 is 53; then add one zero (530).

IV. Multiplying whole numbers

A. Set up the problem by putting the larger factor on top.
(NOTE: Put the ones in the one column, tens in tens column, etc.)

Example:
$$\begin{array}{r} 11 \\ \underline{\times 8} \end{array}$$

B. Starting from right to left, multiply the top number by the bottom number in the ones column.

Example:
$$\begin{array}{r} 12 \\ \underline{\times 13} \\ 36 \end{array}$$
3 times 2 is 6;
3 times 1 is 3.

(NOTE: This is a partial answer)

C. Multiply the top number by the bottom number in the tens column.

Example:
$$\begin{array}{r} 12 \\ \underline{\times 13} \\ 36 \\ \underline{12} \end{array}$$
1 times 2 is 2;
1 times 1 is 1.

(NOTE: Make sure you start recording this step in the tens column, moving to the left 1 column with each multiplication step.)

INFORMATION SHEET

D. Add both partial answers as they are lined in columns to obtain the product.

Example:

$$\begin{array}{rl} 12 & \\ \underline{\times 13} & \\ 36 & \\ \underline{12} & \\ 156 & \text{Product} \end{array}$$

E. Sometimes the product of a column will be greater than 9. In that case, carry the digit with the higher value to the column to the left and add it to the product obtained in that column.

Example:

$$\begin{array}{r} 2 \\ 15 \\ \underline{\times 5} \\ 75 \end{array}$$

1. 5 times 5 is 25; record the 5 in the ones column and carry the 2 (tens) to the tens column.
2. Next multiply 5 times 1 (ten) which equals 5 (tens) and add the carried 2 (tens) for a total of 7 (tens).
3. Your answer is 7 tens and 5 ones, or 75.

F. Treat a zero as any other digit in multiplication in order to maintain the place value of the digits.

Examples:

$$\begin{array}{r} 102 \\ \underline{\times\ 3} \\ 306 \end{array}$$

3 times 2 is 6;
3 times 0 is 0;
3 times 1 is 3.

$$\begin{array}{r} 145 \\ \underline{\times 106} \\ 870 \\ 000 \\ \underline{145} \\ 15370 \end{array}$$

6 times 5 is 30. Record the 0 in the ones place and carry the 3 to the tens place. 6 times 4 is 24. Add the carried 3 for a sum of 27. Record the 7 in the tens place and carry the 2. 6 times 1 is 6. Add the carried 2 for a sum of 8. Record the 8 in the hundreds place.

0 times 5 is 0. Record the 0 in the tens place. 0 times 4 is 0. Record 0 in the hundreds place. 0 times 1 is 0. Record 0 in the thousands place.

INFORMATION SHEET

1 times 5 is 5. Record the 5 in the hundreds place. 1 times 4 is 4. Record the 4 in the thousands place. 1 times 1 is 1. Record 1 in the ten thousands place.

Find the sum of the partial answers for the product.

(NOTE: Zero times any number is zero. Any number times zero is zero.)

INFORMATION SHEET

D. Add both partial answers as they are lined in columns to obtain the product.

Example:

$$\begin{array}{r} 12 \\ \times 13 \\ \hline 36 \\ 12 \\ \hline 156 \end{array} \quad \text{Product}$$

E. Sometimes the product of a column will be greater than 9. In that case, carry the digit with the higher value to the column to the left and add it to the product obtained in that column.

Example:

$$\begin{array}{r} 2 \\ 15 \\ \times 5 \\ \hline 75 \end{array}$$

1. 5 times 5 is 25; record the 5 in the ones column and carry the 2 (tens) to the tens column.
2. Next multiply 5 times 1 (ten) which equals 5 (tens) and add the carried 2 (tens) for a total of 7 (tens).
3. Your answer is 7 tens and 5 ones, or 75.

F. Treat a zero as any other digit in multiplication in order to maintain the place value of the digits.

Examples:

$$\begin{array}{r} 102 \\ \times\ 3 \\ \hline 306 \end{array}$$

3 times 2 is 6;
3 times 0 is 0;
3 times 1 is 3.

$$\begin{array}{r} 145 \\ \times 106 \\ \hline 870 \\ 000 \\ 145 \\ \hline 15370 \end{array}$$

6 times 5 is 30. Record the 0 in the ones place and carry the 3 to the tens place. 6 times 4 is 24. Add the carried 3 for a sum of 27. Record the 7 in the tens place and carry the 2. 6 times 1 is 6. Add the carried 2 for a sum of 8. Record the 8 in the hundreds place.

0 times 5 is 0. Record the 0 in the tens place. 0 times 4 is 0. Record 0 in the hundreds place. 0 times 1 is 0. Record 0 in the thousands place.

INFORMATION SHEET

1 times 5 is 5. Record the 5 in the hundreds place. 1 times 4 is 4. Record the 4 in the thousands place. 1 times 1 is 1. Record 1 in the ten thousands place.

Find the sum of the partial answers for the product.

(NOTE: Zero times any number is zero. Any number times zero is zero.)

MULTIPLICATION TABLE

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

ASSIGNMENT SHEET #1--WRITE MULTIPLICATION OF WHOLE NUMBERS THROUGH TWELVE

Directions: Complete the table below.

1	2	3									
	4			10							
					24						
				35							
										99	

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

ASSIGNMENT SHEET #1--WRITE MULTIPLICATION OF WHOLE NUMBERS THROUGH TWELVE

Directions: Complete the table below.

1	2	3									
	4			10							
					24						
				35							
										99	

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

ASSIGNMENT SHEET #2--MULTIPLY WHOLE NUMBERS WHERE NO CARRYING IS REQUIRED

Directions: Multiply the following problems and record your answers.

1.	a) 23 3	b) 42 2	c) 12 3	d) 24 2
2.	a) 13 2	b) 12 3	c) 23 3	d) 41 2
3.	a) 31 3	b) 32 2	c) 42 2	d) 14 2
4.	a) 13 3	b) 56 1	c) 43 1	d) 21 2

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

ASSIGNMENT SHEET #3--MULTIPLY WHOLE NUMBERS WHERE CARRYING IS REQUIRED

Directions: Multiply the following problems and record your answers.

1.	a)	45	b)	67	c)	45	d)	64
		3		4		5		2
2.	a)	67	b)	42	c)	46	d)	93
		12		43		45		23
3.	a)	74	b)	34	c)	39	d)	52
		7		8		5		6
4.	a)	25	b)	35	c)	68	d)	39
		57		89		47		25

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

ASSIGNMENT SHEET #4--MULTIPLY NUMBERS INVOLVING PROPERTIES OF ZERO

Directions: Multiply the following and record your answers.

1. a) $\begin{array}{r}490\\ \underline{43}\end{array}$ b) $\begin{array}{r}504\\ \underline{23}\end{array}$ c) $\begin{array}{r}300\\ \underline{65}\end{array}$

2. a) $\begin{array}{r}4080\\ \underline{23}\end{array}$ b) $\begin{array}{r}5403\\ \underline{56}\end{array}$ c) $\begin{array}{r}5004\\ \underline{12}\end{array}$

3. a) $\begin{array}{r}403\\ \underline{57}\end{array}$ b) $\begin{array}{r}590\\ \underline{22}\end{array}$ c) $\begin{array}{r}306\\ \underline{20}\end{array}$

4. a) $\begin{array}{r}6000\\ \underline{95}\end{array}$ b) $\begin{array}{r}2501\\ \underline{32}\end{array}$ c) $\begin{array}{r}3056\\ \underline{42}\end{array}$

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #2

1. a. 69
   b. 84
   c. 36
   d. 48
2. a. 26
   b. 36
   c. 69
   d. 82
3. a. 93
   b. 64
   c. 84
   d. 28
4. a. 39
   b. 56
   c. 43
   d. 42

ASSIGNMENT SHEET #3

1. a. 135
   b. 268
   c. 225
   d. 128
2. a. 804
   b. 1806
   c. 2070
   d. 2139
3. a. 518
   b. 272
   c. 195
   d. 312
4. a. 1425
   b. 3115
   c. 3196
   d. 975

ASSIGNMENT SHEET #4

1. a. 21070
   b. 11592
   c. 19500
2. a. 93840
   b. 302568
   c. 60048
3. a. 22971
   b. 12980
   c. 6120
4. a. 570000
   b. 80032
   c. 128352

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

TEST

1. Complete the multiplication table.

1	2										
2	4										
										121	132
										132	144

2. a. 44 x 2 b. 23 x 3 c. 42 x 1 d. 22 x 4 e. 32 x 2 f. 33 x 3

3. a. 36 x 4 b. 42 x 7 c. 19 x 6 d. 75 x 23 e. 82 x 49

4. a. $\begin{array}{r}509\\ \underline{\times\ 32}\end{array}$ b. $\begin{array}{r}340\\ \underline{\times\ 19}\end{array}$ c. $\begin{array}{r}609\\ \underline{\times\ 103}\end{array}$ d. $\begin{array}{r}704\\ \underline{\times\ 24}\end{array}$ e. $\begin{array}{r}689\\ \underline{\times\ 204}\end{array}$

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

TEST

1. Complete the multiplication table.

1	2										
2	4										
										121	132
										132	144

2. a. $\begin{array}{r}44\\ \underline{x\ 2}\end{array}$ b. $\begin{array}{r}23\\ \underline{x\ 3}\end{array}$ c. $\begin{array}{r}42\\ \underline{x\ 1}\end{array}$ d. $\begin{array}{r}22\\ \underline{x\ 4}\end{array}$ e. $\begin{array}{r}32\\ \underline{x\ 2}\end{array}$ f. $\begin{array}{r}33\\ \underline{x\ 3}\end{array}$

3. a. $\begin{array}{r}36\\ \underline{x\ 4}\end{array}$ b. $\begin{array}{r}42\\ \underline{x\ 7}\end{array}$ c. $\begin{array}{r}19\\ \underline{x\ 6}\end{array}$ d. $\begin{array}{r}75\\ \underline{x\ 23}\end{array}$ e. $\begin{array}{r}82\\ \underline{x\ 49}\end{array}$

4. a. $\begin{array}{r}509\\ \underline{\times\ 32}\end{array}$ b. $\begin{array}{r}340\\ \underline{\times\ 19}\end{array}$ c. $\begin{array}{r}609\\ \underline{\times\ 103}\end{array}$ d. $\begin{array}{r}704\\ \underline{\times\ 24}\end{array}$ e. $\begin{array}{r}689\\ \underline{\times\ 204}\end{array}$

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

TEST

1. Complete the multiplication table.

1	2										
2	4										
										121	132
										132	144

2. a. 44 b. 23 c. 42 d. 22 e. 32 f. 33
x 2 x 3 x 1 x 4 x 2 x 3

3. a. 36 b. 42 c. 19 d. 75 e. 82
x 4 x 7 x 6 x 23 x 49

4. a. $\begin{array}{r}509\\ \underline{\text{x }32}\end{array}$ b. $\begin{array}{r}340\\ \underline{\text{x }19}\end{array}$ c. $\begin{array}{r}609\\ \underline{\text{x }103}\end{array}$ d. $\begin{array}{r}704\\ \underline{\text{x }24}\end{array}$ e. $\begin{array}{r}689\\ \underline{\text{x }204}\end{array}$

MULTIPLICATION OF WHOLE NUMBERS
UNIT IV

ANSWERS TO TEST

1.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

2. a. 88 b. 69 c. 42 d. 88 e. 64 f. 99

3. a. 144 b. 294 c. 114 d. 1725 e. 4018

4. a. 16288 b. 6460 c. 62727 d. 16896 e. 140556

DIVISION OF WHOLE NUMBERS
UNIT V

UNIT OBJECTIVE

After completion of this unit, the student should be able to divide whole numbers. This will be evidenced by correctly performing the procedures outlined in the assignment sheets and by scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Find the quotient with single digit divisors using whole numbers.
2. Find the quotient with multiple digit divisors using whole numbers.
3. Find the quotient with problems involving properties of zero.

DIVISION OF WHOLE NUMBERS
UNIT V

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

  A. Objective sheet

  B. Information sheet

  C. Assignment sheets-

    1. Assignment Sheet #1--Find the quotient with single divisors using whole numbers.

    2. Assignment Sheet #2--Find the quotient with multiple digit divisors using whole numbers.

    3. Assignment Sheet #3--Find the quotient with problems involving properties of zero.

  D. Answers to assignment sheets

  E. Test

  F. Answers to test

II. References:

  A. Aufman, Richard N. and Vernon C. Barker. Essential Mathematics. Boston, MA 02108: Houghton Mifflin Co., 1982.

DIVISION OF WHOLE NUMBERS
UNIT V

INFORMATION SHEET

I. Terms and Definitions

A. Division--The process of separating the total into equal size groups, commonly designated by the division symbol, ÷ or /

B. Dividend--The number to be divided

C. Divisor--The number by which you divide

D. Quotient--The answer to a division problem

E. Remainder--The number that is left over when division is complete; this is the part of the divisor that remains

F. r--The symbol for the remainder

```
Examples:      123 quotient
    divisor3/ 369 dividend

              151  rl
           3/ 454
              3
              15
              15
               04
                3
                1
```

II. Dividing Whole Numbers

A. Set up the problem with the dividend within the division frame and the divisor to the left of the division frame.

```
Example:        123
             3/ 369
                3
                06
                 6
                 09
                  9
                  0
```

INFORMATION SHEET

1. 3 divides into 3, 1 time; record this partial quotient, multiply the partial quotient by the divisor and subtract.

2. Bring down the next digit 6 and divide 3 into the 06 for a partial quotient of 2.

3. Multiply 2 times 3; record 6 under the 06, subtract and bring down the next digit 9.

4. Divide 3 into 09 for another partial quotient of 3. Repeat the multiplication process by multiplying 3 times 3; record 9 under the 09 and subtract.

B. Estimate how many times the divisor will divide into the first one (or more) digits of the dividend.

Example:

$$\begin{array}{r} 4 \\ 12\overline{)\,48} \end{array}$$

(NOTE: If the divisor is larger than the 1st digit, write 0 in the partial quotient above the digit and divide into two digits. Repeat this process if the divisor will not go into the 1st 2 digits.)

Example:

$$\begin{array}{r} 04 \\ 12\overline{)\,48} \end{array}$$

12 will not divide into 4; write 0 above the 4; 12 will go into 48, 4 times, write 4 above the 8.

C. Place this trial answer over the dividend and multiply it by the divisor. Write the product under the dividend and subtract.

(NOTE: If the product is larger than the dividend, the trial answer is too large. Try a smaller number.)

Example:

$$\begin{array}{r} 04 \\ 12\overline{)\,48} \\ \underline{48} \\ 0 \end{array}$$

(NOTE: If the difference is equal to or greater than the divisor, the trial answer is too small. Try a larger number.)

D. If the dividend does not divide evenly, the difference left after the subtraction step becomes part of the next division process.

INFORMATION SHEET

Example:

$$\begin{array}{r} 68 \\ 2\overline{)136} \\ \underline{12} \\ 16 \\ \underline{16} \\ 0 \end{array}$$

1. Divide 2 into 13 for a partial quotient of 6.

2. Multiply 6 times 2, record the product under the 13, and subtract.

3. The 1 becomes a part of the dividend in the next step.

4. Bring down the next digit, 6, for a new dividend of 16.

5. Repeat the process by dividing 2 into 16 for a partial quotient of 8.

6. Multiply 8 times 2. Record the product (16) under the existing dividend and subtract.

(NOTE: In the event that the divisor will not divide into the new dividend, put a 0 in the quotient before bringing down the next digits.)

Example:

$$\begin{array}{r} 102 \\ 5\overline{)510} \\ \underline{5} \\ 1 \\ \underline{0} \\ 10 \\ \underline{10} \end{array}$$

F. If the dividend does not divide evenly after the final quotient is obtained, write the leftover number(s) as a remainder.

Example:

$$\begin{array}{r} 174 \text{ r1} \\ 3\overline{)523} \\ \underline{3} \\ 22 \\ \underline{21} \\ 13 \\ \underline{12} \\ 1 \end{array}$$

3 will not divide into 1; therefore, the 1 is written as a remainder beside the quotient.

INFORMATION SHEET

G. Treat a zero as any other digit in division, making sure its place value is maintained.

Example:

$$\begin{array}{r} 1020 \\ 2/\overline{2040} \\ \underline{2} \\ 00 \\ \underline{0} \\ 04 \\ \underline{4} \\ 00 \end{array}$$

In this example, both of the zeros are necessary in the quotient to mark the place values of the quotient.

III. Checking Division Problems

A. Multiply the quotient by the divisor.

B. Add any remainder.

C. If the sum is equal to the dividend, the quotient is correct.

Example:

$$\begin{array}{rl} 174 & \text{r1} \\ 3/\overline{523} & \\ \underline{3} & \\ 22 & \\ \underline{21} & \\ 13 & \\ \underline{12} & \\ 1 & \end{array}$$

Check: $174 \times 3 = 522$

$$\begin{array}{r} 522 \\ \underline{+1} \\ 523 \end{array}$$

DIVISION OF WHOLE NUMBERS
UNIT V

ASSIGNMENT SHEET #1--FIND THE QUOTIENT WITH SINGLE DIVISORS USING WHOLE NUMBERS

Directions: Divide the following problems. Show your computations and record your answers.

1. a) $4\overline{)8}$ b) $3\overline{)6}$ c) $2\overline{)22}$

d) $3\overline{)36}$ e) $4\overline{)48}$

2. a) $3\overline{)86}$ b) $2\overline{)37}$ c) $7\overline{)81}$

d) $2\overline{)85}$ e) $5\overline{)37}$

DIVISION OF WHOLE NUMBERS
UNIT V

ASSIGNMENT SHEET #2--FIND THE QUOTIENT WITH MULTIPLE DIGIT DIVISORS USING WHOLE NUMBERS

Directions: Divide the following problems. Show your computations and record your answers.

1. a) $52\overline{)273}$ b) $62\overline{)372}$ c) $16\overline{)73}$

   d) $71\overline{)355}$ e) $53\overline{)328}$

2. a) $238\overline{)965}$ b) $119\overline{)746}$ c) $221\overline{)1547}$

   d) $125\overline{)625}$ e) $949\overline{)9988}$

DIVISION OF WHOLE NUMBERS
UNIT V

ASSIGNMENT SHEET #3--FIND THE QUOTIENT WITH PROBLEMS INVOLVING PROPERTIES OF ZERO

Directions: Find the quotients of the problems below. Show your computations and record your answers.

1. a) $325/\overline{7800}$ b) $563/\overline{4501}$ c) $517/\overline{9007}$

d) $720/\overline{8640}$ e) $101/\overline{9876}$

2. a) $925/\overline{8905}$ b) $246/\overline{7630}$ c) $752/\overline{7600}$

d) $813/\overline{90000}$ e) $500/\overline{20500}$

DIVISION OF WHOLE NUMBERS
UNIT V

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

	1.	2.
a.	2	28r2
b.	2	43r1
c.	11	11r4
d.	12	42r1
e.	12	7r2

ASSIGNMENT SHEET #2

	1.	2.
a.	5r13	4r13
b.	6	6r32
c.	4r9	7
d.	5	5
e.	6r10	10r498

ASSIGNMENT SHEET #3

	1.	2.
a.	24	9r580
b.	7r560	31r4
c.	17r218	10r80
d.	12	110r570
e.	97r79	41

DIVISION OF WHOLE NUMBERS
UNIT V

TEST

1. a) $3\overline{)9}$ b) $9\overline{)81}$ c) $7\overline{)49}$

d) $6\overline{)96}$ e) $9\overline{)630}$ f) $3\overline{)690}$

g) $7\overline{)203}$ h) $9\overline{)6327}$ i) $6\overline{)19254}$

TEST

j) $44/\overline{82}$ k) $67/\overline{93}$ l) $32/\overline{693}$

2. a) $42/\overline{21210}$ b) $29/\overline{11235}$

3. a) $67/\overline{907}$ b) $92/\overline{500}$ c) $50/\overline{467}$

d) $504/\overline{6504}$

DIVISION OF WHOLE NUMBERS
UNIT V

ANSWERS TO TEST

1. a. 3
   b. 9
   c. 7
   d. 16
   e. 70
   f. 230
   g. 29
   h. 703
   i. 3209
   j. 1r38
   k. 1r26
   l. 21r21

2. a. 505
   b. 387r12

3. a. 13r36
   b. 5r40
   c. 9r17
   d. 12r456

MIXED COMPUTATIONS OF WHOLE NUMBERS
UNIT VI

UNIT OBJECTIVE

After completing this unit, the student should be able to add, subtract, multiply, and divide whole numbers. This will be evidenced by correctly performing the procedures outlined in the assignment sheets and by scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of the unit, the student should be able to:

1. Define the operation needed to solve a given problem as indicated by a symbol or description.
2. Solve a given problem by using the operation indicated by a symbol or description.

MIXED COMPUTATION OF WHOLE NUMBERS
UNIT VI

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

  A. Objective sheet

  B. Information sheet

  C. Assignment sheets-

    1. Assignment Sheet #1--Define operation needed to solve computation.

    2. Assignment Sheet #2--Solve problems using mixed operations.

  D. Answers to assignment sheets

  E. Test

  F. Answers to test

II. References:

  A. Shea, James T. Working with Numbers. Austin, TX 78768: Steck-Vaughn Co., 1980.

MIXED COMPUTATION OF WHOLE NUMBERS
UNIT VI

INFORMATION SHEET

I. Terms and Definitions

A. Addition--Combining together, indicated by the symbol + or by terms such as plus, add, find the sum, or total

B. Subtraction--Taking away, indicated by the symbol - or by terms such as subtract, minus, take away, or find the difference

C. Multiplication--Combining like numbers quickly, indicated by the symbol x or by terms such as multiply, find the product; also symbolized by use of parentheses (2)(3), or raised dot 2·3

D. Division--Separating into equal sized groups, indicated by the symbols ÷ or $\overline{)\quad}$, or by terms such as divided by or find the quotient

II. Procedures

A. Determine operational symbol or word

B. Apply operational procedure

Example: 25 ÷ 5

Step 1--determine sign ÷ means divide

Step 2--set up problem $5\overline{)25}$

Step 3--Solve problem

$$\begin{array}{r} 5 \\ 5\overline{)25} \\ \underline{-25} \\ 0 \end{array}$$

Step 4--Answer is 5

MIXED COMPUTATION OF WHOLE NUMBERS
UNIT VI

ASSIGNMENT SHEET #1--DEFINE OPERATION NEEDED TO SOLVE COMPUTATION

Directions: Fill in the blank with the operation indicated by the following words or symbols. The four operations are addition, subtraction, multiplication, and division. The first answer has been given.

1. + Addition
2. - ____________________
3. x ____________________
4. ÷ ____________________
5. plus ____________________
6. find the sum ____________________
7. find the product ____________________
8. find the difference ____________________
9. find the quotient ____________________
10. minus ____________________
11. divide ____________________
12. multiply ____________________
13. find the total ____________________
14. (5)(3) ____________________
15. times ____________________

MIXED COMPUTATION OF WHOLE NUMBERS
UNIT VI

ASSIGNMENT SHEET #2--SOLVE PROBLEMS USING MIXED OPERATIONS

Directions: Solve the following problems using the operation indicated by the symbols or words.

1. a. $\begin{array}{r} 6 \\ \underline{+2} \end{array}$ b. $\begin{array}{r} 32 \\ \underline{-11} \end{array}$ c. $25 \div 5 =$

   d. $15 \times 3 =$

2. a. 16 minus 2 = b. 3 times 15 =

   c. 16 divided by 2 = d. 4 plus 22 =

3. Find the sum:

   a. $\begin{array}{r} 3 \\ \underline{2} \end{array}$ b. $\begin{array}{r} 6 \\ \underline{8} \end{array}$ c. $\begin{array}{r} 22 \\ \underline{11} \end{array}$ d. $\begin{array}{r} 13 \\ \underline{20} \end{array}$

4. Find the quotient:

   a. $3\overline{)15}$ b. $2\overline{)30}$ c. $45\overline{)135}$ d. $6\overline{)84}$

5. Find the difference:

   a. $\begin{array}{r} 6 \\ \underline{2} \end{array}$ b. $\begin{array}{r} 13 \\ \underline{5} \end{array}$ c. $\begin{array}{r} 22 \\ \underline{1} \end{array}$ d. $\begin{array}{r} 14 \\ \underline{11} \end{array}$

ASSIGNMENT SHEET #2

6. Find the product:

a. $\begin{array}{r} 63 \\ \underline{\quad 2} \end{array}$ b. $\begin{array}{r} 18 \\ \underline{\quad 3} \end{array}$ c. $\begin{array}{r} 22 \\ \underline{\quad 11} \end{array}$ d. $\begin{array}{r} 31 \\ \underline{\quad 63} \end{array}$

MIXED COMPUTATION OF WHOLE NUMBERS
UNIT VI

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

1. addition
2. subtraction
3. multiplication
4. division
5. addition
6. addition
7. multiplication
8. subtraction
9. division
10. subtraction
11. division
12. multiplication
13. addition
14. multiplication
15. multiplication

ASSIGNMENT SHEET #2

1. a. 8
   b. 21
   c. 5
   d. 45
2. a. 14
   b. 45
   c. 8
   d. 26
3. a. 5
   b. 14
   c. 33
   d. 33
4. a. 5
   b. 15
   c. 3
   d. 14
5. a. 4
   b. 8
   c. 21
   d. 3
6. a. 186
   b. 54
   c. 242
   d. 1953

MIXED COMPUTATION OF WHOLE NUMBERS
UNIT VI

TEST

Directions: Fill in the blanks with the symbol +, -, x or ÷ to indicate which operation is appropriate for solving the given problems. Then solve the problems.

1. sign   2. answer

_____ _______ a. Crystal's tuition fee is $225.00. She has $75.00 to pay on it. How much more does Crystal need?

_____ _______ b. At $5.00 for each lawn, how much did Mark make by mowing 15 lawns?

_____ _______ c. 1500 leather coats need inspecting. The leather coats are to be divided evenly among 30 employees. How many coats must each employee inspect?

_____ _______ d. You added a $750 deposit to your checking account of $1250. What is the new balance after the $750 deposit?

PTM -121-A

MIXED COMPUTATION OF WHOLE NUMBERS
UNIT VI

TEST

Directions: Fill in the blanks with the symbol +, -, x or - to indicate which operation is appropriate for solving the given problems. Then solve the problems.

1. sign   2. answer

_____ _______ a. Crystal's tuition fee is $225.00. She has $75.00 to pay on it. How much more does Crystal need?

_____ _______ b. At $5.00 for each lawn, how much did Mark make by mowing 15 lawns?

_____ _______ c. 1500 leather coats need inspecting. The leather coats are to be divided evenly among 30 employees. How many coats must each employee inspect?

_____ _______ d. You added a $750 deposit to your checking account of $1250. What is the new balance after the $750 deposit?

MIXED COMPUTATION OF WHOLE NUMBERS
UNIT VI

ANSWERS TO TEST

	1.	2.
a.	-	$150.00
b.	x	$75.00
c.	÷	50
d.	+	$2000

ESTIMATE WHOLE NUMBERS
UNIT VII

UNIT OBJECTIVE

After completion of this unit, the student should be able to estimate whole number problem solutions. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by successfully scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Round off whole numbers to given place values.
2. Compute the average of given groups of whole numbers.

ESTIMATE WHOLE NUMBERS
UNIT VII

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

  A. Objective sheet

  B. Information sheet

  C. Assignment sheets-

    1. Assignment Sheet #1--Round off whole numbers to given place value

    2. Assignment Sheet #2--Compute the average of given groups of whole numbers

  D. Answers to assignment sheets

  E. Test

  F. Answers to test

II. References:

  A. Cleaves, Cheryl, Marge Hobbs and Paul Dudenhefer. Basic Mathematics for Trades and Technologies. Englewood Cliffs, NJ 07632: Prentice-Hall Inc., 1983.

ESTIMATE WHOLE NUMBERS
UNIT VII

INFORMATION SHEET

I. Terms and Definitions

A. Estimate--To make a careful approximate calculation

B. Rounding--Expression of numbers in even digits, such as tens, hundreds, thousands, etc

C. Average--A total divided by the number of numbers in the total

II. Rounding--To round off a number to a given place. This is especially useful in making estimates

A. Underline the digit of the place value to which you wish to round off.

B. Look at the digit immediately to the right of the underlined digit.

C. If that digit is less than 5, keep the underlined digit as is and replace the digits to the right of this place with zero(s).

D. If the digit to the right of the underlined digit is 5 or more, add 1 to the underlined digit and replace the digit(s) to the right of this place with zero(s).

Examples:

1. Round to the nearest hundreds: 5,283

   $5,\underline{2}83$ is rounded to $5,\underline{3}00$ because the digit to the right of $\underline{2}00$ is 8 and, therefore, more than 5. The 2 hundred place becomes 3 hundred and the 8 and 3 are both replaced by zero.

2. 42 rounded to nearest tens is 40

3. 49 rounded to nearest tens is 50

4. 391 rounded to nearest hundred is 400

5. 319 rounded to nearest hundred is 300

ESTIMATE WHOLE NUMBERS
UNIT VII

ASSIGNMENT SHEET #1--ROUND OFF WHOLE NUMBERS TO GIVEN PLACE VALUE

Directions: Round off to the nearest ten:

1. a. 753_____ b. 615_____ c. 496_____

d. 204_____ e. 476_____

2. a. 12______ b. 27______ c. 38______

d. 62______ e. 89______

Round off to the nearest hundred:

3. a. 876_____ b. 587_____ c. 450_____

d. 302_____ e. 999_____

Round off to the nearest thousand:

4. a. 3546_____ b. 7650_____ c. 6120_____

d. 9999_____

ESTIMATE WHOLE NUMBERS
UNIT VII

ASSIGNMENT SHEET #2--COMPUTE THE AVERAGE OF GIVEN GROUPS OF WHOLE NUMBERS

Directions: Find the sum in the following problems. Then find the average for each problem.

Example:
46
82
92
222

3

74 = average
3/ 222
21
12

1.
64
42
16
12

2.
56
49
35

3.
49
36
82
98
33

4.
65
64
60

5.
908
465
594
308

6.
55
34
47
28
42
59

ESTIMATE WHOLE NUMBERS
UNIT VII

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

1.
   a. 750
   b. 620
   c. 500
   d. 200
   e. 480
2.
   a. 10
   b. 30
   c. 40
   d. 60
   e. 90
3.
   a. 900
   b. 600
   c. 400
   d. 300
   e. 1000
4.
   a. 4000
   b. 8000
   c. 6000
   d. 10,000

ASSIGNMENT SHEET #2

1. $\begin{array}{r} 33 \text{ r2} \\ 4\overline{)134} \end{array}$

2. $\begin{array}{r} 46 \text{ r2} \\ 3\overline{)140} \end{array}$

3. $\begin{array}{r} 59 \text{ r3} \\ 5\overline{)298} \end{array}$

4. $\begin{array}{r} 63 \\ 3\overline{)189} \end{array}$

5. $\begin{array}{r} 568 \text{ r3} \\ 4\overline{)2275} \end{array}$

6. $\begin{array}{r} 44 \text{ r1} \\ 6\overline{)265} \end{array}$

ESTIMATE WHOLE NUMBERS
UNIT VII

TEST

1. Round off the following numbers to the nearest ten:

a. 73______

b. 85______

c. 841______

d. 778______

Round off the following numbers to the nearest hundred:

e. 748______

f. 784______

g. 529______

h. 618______

i. 901______

j. 991______

Round off the following numbers to the nearest thousand:

k. 1832_____

l. 4539_____

m. 5629_____

n. 7293_____

2. Find the average of each group of numbers:

a.	b.	c.	d.
653	45	758	6
750	59	800	9
900	60	650	8
549	35		5
	51		7
			7

TEST

2. e. 5621
6213
7123

f. 56200
72504

ESTIMATE WHOLE NUMBERS
UNIT VII

TEST

1. Round off the following numbers to the nearest ten:

a. 73_______
b. 85_______
c. 841______
d. 778______

Round off the following numbers to the nearest hundred:

e. 748______ h. 618______
f. 784______ i. 901______
g. 529______ j. 991______

Round off the following numbers to the nearest thousand:

k. 1832_____ m. 5629_____
l. 4539_____ n. 7293_____

2. Find the average of each group of numbers:

a.	b.	c.	d.
653	45	758	6
750	59	800	9
900	60	650	8
549	35		5
	51		7
			7

/‾‾‾‾‾‾ /‾‾‾‾‾‾ /‾‾‾‾‾‾ /‾‾‾‾‾‾

TEST

2. e. 5621
6213
7123

f. 56200
-72504

ESTIMATE WHOLE NUMBERS
UNIT VII

ANSWERS TO TEST

1. a. 70
   b. 80
   c. 840
   d. 780

   e. 700
   f. 800
   g. 500
   h. 600
   i. 900
   j. 1000

   k. 2000
   l. 5000
   m. 6000
   n. 7000

2. a. 713
   b. 50
   c. 736
   d. 7
   e. 6319
   f. 64352

ESTIMATE WHOLE NUMBERS
UNIT VII

ANSWERS TO TEST

1. a. 70
   b. 80
   c. 840
   d. 780

   e. 700
   f. 800
   g. 500
   h. 600
   i. 900
   j. 1000

   k. 2000
   l. 5000
   m. 6000
   n. 7000

2. a. 713
   b. 50
   c. 736
   d. 7
   e. 6319
   f. 64352

FRACTION NOTATION
UNIT I

UNIT OBJECTIVE

After completion of this unit, the student should be able to add and subtract fractions with like denominators. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by successfully scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit of instruction, the student will be able to:

1. Express part/whole relationships as fractions.
2. Match terms and definitions related to fractions.
3. Reduce given fractions to lowest terms.

FRACTION NOTATION
UNIT I

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

  A. Objective sheet

  B. Information sheet

  C. Assignment sheets-

    1. Assignment Sheet #1--Express part/whole relationships as fractions.

    2. Assignment Sheet #2--Match terms and definitions related to fractions.

    3. Assignment Sheet #3--Reduce fractions to lowest terms.

  D. Answers to assignment sheets

  E. Test

  F. Answers to test

II. References:

  A. Shea, James T. Basic Essentials of Math, Part I, 2nd Ed. Austin, TX 78768: Steck-Vaughn Co., 1980.

FRACTION NOTATION
UNIT I

INFORMATION SHEET

I. Terms and Definitions

A. Fraction--A part of a whole

B. Numerator--The top numeral in a fraction; tells how many equal parts you have of the whole

C. Denominator--The bottom numeral in a fraction; tells into how many equal parts the whole has been divided

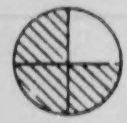
D. Factor--A number which will divide evenly into either the denominator or numerator

E. Common Factor--A number which will divide evenly into both the denominator and numerator

II. Forms of Fractions

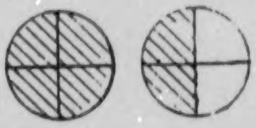
A. Proper Fractions--A fraction in which the numerator is always smaller than the denominator; a fraction which is less than one whole

Example: $\frac{3}{4}$



B. Improper Fraction--A fraction in which the numerator is equal to or larger than the denominator; a fraction which equals or is greater than one whole

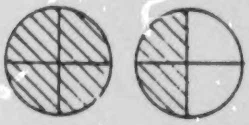
Example: $\frac{6}{4}$



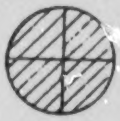
= $\frac{6}{4}$

C. Mixed Number--A whole number and a fraction written together; the value of a mixed number is always more than one whole

Example: $1\frac{2}{4}$



$= 1\frac{2}{4}$

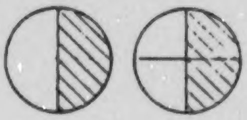


$= \frac{4}{4} = 1$

(NOTE: When the numerator and denominator are the same, the fraction represents the whole number 1.)

D. Equivalent Fractions--Fractions which are different in form but are equal in value

Example: $\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$



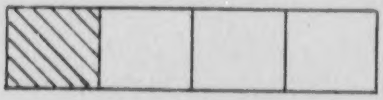
III. Writing Fractions

A. Determine how many equal parts into which the whole is divided. This is the denominator or bottom number of the fraction.

B. Determine how many equal parts of the whole you have. This is the numerator and is written above the denominator.

C. Separate the two numerals with a line.

(NOTE: This line indicates division.)



This whole rectangle has been divided into 4 equal parts. The denominator is 4. There is 1 part shaded. Therefore, the part of the whole which is shaded is 1/4.

IV. Reducing Fractions

A. To reduce a fraction to its lowest terms, divide both the numerator and denominator by a factor (number) common to both. Repeat this process until there are no more common factors.

B. Check to see if the numerator will divide evenly with the denominator. If so, the numerator is the common factor. Reduce by the common factor.

C. Find the prime factors of the numerator. Try to divide the denominator by each.

D. If the number is larger than the denominator, reduce the improper fraction to a mixed number.

Example: $\frac{11}{4} = 2\frac{3}{4}$

1. Divide the denominator into the numerator to find how many whole numbers are contained in the improper fraction. In this case, 11/4 = 2 whole numbers. This accounts for 8/4 of the improper fraction.

2. Subtract the number of parts in the whole numbers from the improper fraction.

$$\begin{array}{r} \frac{11}{4} \\ -\ \frac{8}{4} \\ \hline \frac{3}{4} \end{array}$$

3. Combine the whole number and fraction and write 2 3/4 as a mixed number.

(NOTE: If you cannot find the common factor of the numbers try the 2, 3, 5, 7, etc. rule. First try to divide both the numerator and denominator by 2; if that won't work, try 3, then 5, or 7. Continue through odd numbers.)

Example: $\frac{4}{8} = \frac{?}{2}$

1. Divide both 4 and 8 by 4 (common factor).

2. Record the answer in the reduced fraction form.

4 divided by 4 is 1 (new numerator)

8 divided by 4 is 2 (new denominator)

$= \frac{1}{2}$

V. Raising Fractions--To raise a fraction to higher terms, find the missing factor and multiply both the numerator and the denominator by that factor.

Example: $\frac{3}{4} = \frac{?}{20}$

A. Divide the bigger denominator by the smaller denominator to identify the missing factor.

$\begin{array}{r} 5 \\ 4\overline{)\,20} \end{array}$ (missing factor)

B. Multiply the original numerator and denominator by the missing factor identified in the previous step.

$3 \times 5 = 15$

$4 \times 5 = 20$

Therefore; $\frac{3}{4} = \frac{15}{20}$

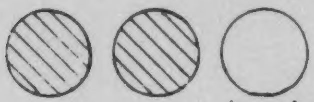
FRACTION NOTATION
UNIT I

ASSIGNMENT SHEET #1--EXPRESS PART/WHOLE RELATIONSHIPS AS FRACTIONS

Directions: Write the fraction which names the shaded part of the whole object or set.

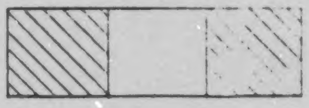
Example:

Whole set of 3 circles



= $\frac{2}{3}$

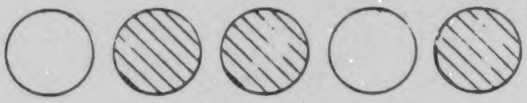
1 whole rectangle

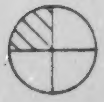


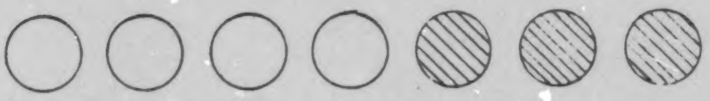
= $\frac{2}{3}$

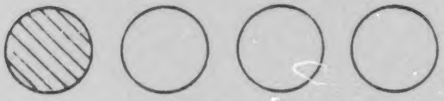
Place your answer in the blank.

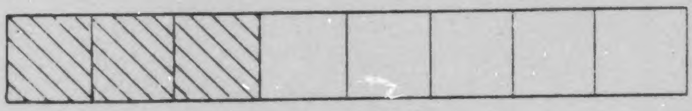
1.

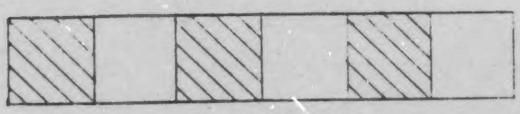
a.  = ______________

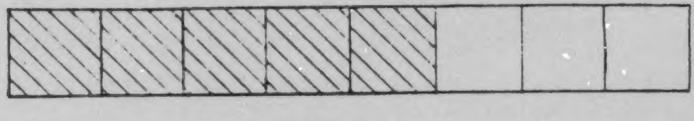
b.  = ______________

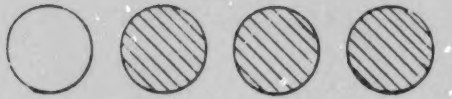
c.  = ______________

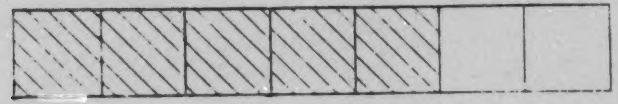
d.  = ______________

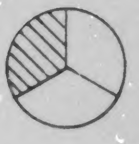
e.  = ______________

f.  = ______________

g.  = ______________

h.  = ______________

i.  = ______________

j.  = ______________

FRACTION NOTATION
UNIT I

ASSIGNMENT SHEET #2--MATCH TERMS AND DEFINITIONS RELATED TO FRACTIONS

Directions: Match the following terms with the corresponding number or definition. Place the letter of the term; A, B, or C, in the blank beside the matching number or definition.

A. Proper Fraction

B. Improper Fraction

C. Mixed Number

_______a. $\frac{2}{3}$

_______b. $2\frac{2}{3}$

_______c. $\frac{6}{5}$

_______d. $\frac{3}{3}$

_______e. $\frac{4}{8}$

_______f. $20\frac{1}{2}$

_______g. $\frac{6}{3}$

_______h. The numerator is the same or greater than the denominator.

_______i. The denominator is greater than the numerator.

_______j. It is expressed as a whole number with a fraction.

FRACTION NOTATION
UNIT I

ASSIGNMENT SHEET #3--REDUCE FRACTIONS TO LOWEST TERMS

Directions: Reduce the following fractions to the lowest terms.

Example: $\frac{2}{4} = \frac{1}{2}$

a. $\frac{5}{25} =$ ______

b. $\frac{24}{26} =$ ______

c. $\frac{30}{58} =$ ______

d. $\frac{3}{9} =$ ______

e. $\frac{33}{66} =$ ______

f. $\frac{21}{35} =$ ______

g. $\frac{49}{63} =$ ______

h. $\frac{6}{8} =$ ______

i. $\frac{25}{100} =$ ______

j. $\frac{10}{15} =$ ______

k. $\frac{12}{24} =$ ______

l. $\frac{27}{30} =$ ______

m. $\frac{8}{10} =$ ______

n. $\frac{2}{16} =$ ______

o. $\frac{18}{24} =$ ______

p. $\frac{5}{10} =$ ______

q. $\frac{225}{500} =$ ______

r. $\frac{9}{18} =$ ______

s. $\frac{7}{21} =$ ______

t. $\frac{16}{24} =$ ______

FRACTION NOTATION
UNIT I

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

a. $\frac{3}{5}$
b. $\frac{1}{4}$
c. $\frac{3}{7}$
d. $\frac{1}{4}$
e. $\frac{3}{8}$
f. $\frac{3}{6}$
g. $\frac{5}{8}$
h. $\frac{3}{4}$
i. $\frac{5}{7}$
j. $\frac{1}{3}$

ASSIGNMENT SHEET #2

a. A
b. C
c. B
d. B
e. A
f. C
g. B
h. B
i. A
j. C

ASSIGNMENT SHEET #3

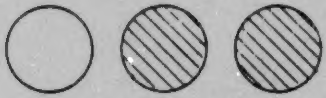
a. $\frac{1}{5}$
b. $\frac{12}{13}$
c. $\frac{15}{29}$
d. $\frac{1}{3}$
e. $\frac{1}{2}$
f. $\frac{3}{5}$
g. $\frac{7}{9}$
h. $\frac{3}{4}$
i. $\frac{1}{4}$
j. $\frac{2}{3}$
k. $\frac{1}{2}$
l. $\frac{9}{10}$
m. $\frac{4}{5}$
n. $\frac{1}{8}$
o. $\frac{3}{4}$
p. $\frac{1}{2}$
q. $\frac{9}{20}$
r. $\frac{1}{2}$
s. $\frac{1}{3}$
t. $\frac{2}{3}$

FRACTION NOTATION
UNIT I

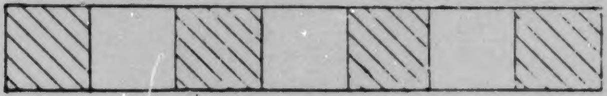
TEST

1. Write the fraction which names the shaded part of the whole object or set.

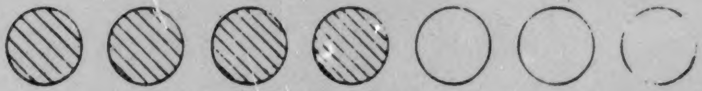
   a.



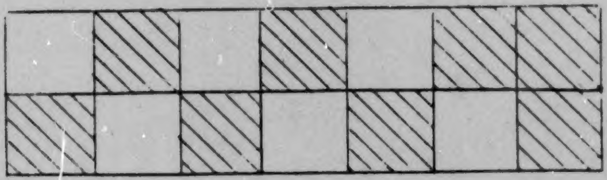
   b.



   c.



   d.



2. Define the following terms:

   a. proper fraction

   b. fraction

   c. common factor

   d. mixed number

   e. improper fraction

   f. denominator

   g. factor

   h. numerator

3. Reduce the following fractions to the lowest terms.

a. $\frac{28}{49} =$

b. $\frac{105}{235} =$

c. $\frac{81}{900} =$

d. $\frac{33}{927} =$

e. $\frac{92}{102} =$

f. $\frac{1025}{3030} =$

g. $\frac{56}{168} =$

h. $\frac{33}{132} =$

i. $\frac{52}{364} =$

j. $\frac{76}{100} =$

k. $\frac{363}{999} =$

l. $\frac{49}{147} =$

m. $\frac{42}{210} =$

FRACTION NOTATION
UNIT I

ANSWERS TO TEST

1. a. $\frac{2}{3}$

   b. $\frac{4}{7}$

   c. $\frac{4}{7}$

   d. $\frac{8}{14}$

2. a. proper fraction - a fraction in which the numerator is always smaller than the denominator, a fraction which is less than one whole

   b. fraction - a part of a whole

   c. common factor - a number which will divide evenly into both the denominator and numerator

   d. mixed number - a whole number and a fraction written together; the value of a mixed number is always more than one whole

   e. improper fraction - a fraction in which the numerator is equal to or larger than the denominator; a fraction which equals or is greater than one whole

   f. denominator - the bottom numeral in a fraction; tells into how many equal parts the whole has been divided

   g. factor - a number which will divide evenly into either the denominator or numerator

   h. numerator - the top numeral in a fraction; tells how many equal parts you have of the whole

3. a. $\frac{4}{7}$

   b. $\frac{21}{47}$

   c. $\frac{9}{100}$

   d. $\frac{11}{309}$

   e. $\frac{46}{51}$

   f. $\frac{205}{606}$

   g. $\frac{1}{3}$

   h. $\frac{1}{4}$

   i. $\frac{1}{7}$

   j. $\frac{19}{25}$

   k. $\frac{121}{333}$

   l. $\frac{1}{3}$

   m. $\frac{1}{5}$

ADDITION OF FRACTIONS
UNIT II

UNIT OBJECTIVE

After completion of this unit, the student should be able to add fractions with like denominators. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by successfully scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit of instruction, the student will be able to:

1. Add fractions with like denominators.
2. Add mixed numbers with like denominators.

ADDITION OF FRACTIONS
UNIT II

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

  A. Objective sheet

  B. Information sheet

  C. Assignment sheets-

    1. Assignment Sheet #1--Add fractions with like denominators.

    2. Assignment Sheet #2--Add mixed numbers with like denominators.

  D. Answers to assignment sheets

  E. Test

  F. Answers to test

ADDITION OF FRACTIONS
UNIT II

INFORMATION SHEET

I. Adding fractions with like denominators

A. Add the numerators and record the answer above the fraction line.

B. Give the answer the same denominator as the fractions being added.

(NOTE: Do not add the denominators.)

Example:

$$\begin{array}{r} \frac{2}{6} \\ + \frac{1}{6} \\ \hline \frac{3}{6} \end{array}$$

C. Reduce the answer to its simplest terms.

Example: $\frac{3}{6} = \frac{1}{2}$

II. Adding mixed numbers with like denominators

A. Add the fractions

B. Add the whole numbers

C. Reduce answer to its simplest terms

(NOTE: Reduce improper fractions to mixed numbers.)

Examples:

$$\begin{array}{r} 1\frac{5}{8} \\ + \frac{1}{8} \\ \hline 1\frac{6}{8} \end{array} = 1\frac{3}{4}$$

(NOTE: When the sum of the fractions results in an improper fraction, reduce the fraction to its lowest terms.)

Example:

$$\begin{array}{l} 2\,\frac{6}{8} \\ \underline{1\,\frac{5}{8}} \\ 3\,\frac{11}{8} = 4\,\frac{3}{8} \end{array}$$

ADDITION OF FRACTIONS
UNIT II

ASSIGNMENT SHEET #1--ADD FRACTIONS WITH LIKE DENOMINATORS.

Directions: Add the following like fractions. Reduce the sum to lowest terms if possible.

Example:
$$\begin{array}{r} \frac{1}{4} \\ + \frac{2}{4} \\ \hline \frac{3}{4} \end{array}$$

a. $$\begin{array}{r} \frac{3}{9} \\ \frac{2}{9} \\ \hline \end{array}$$

b. $$\begin{array}{r} \frac{21}{50} \\ \frac{5}{50} \\ \hline \end{array}$$

c. $$\begin{array}{r} \frac{2}{6} \\ \frac{3}{6} \\ \hline \end{array}$$

d. $$\begin{array}{r} \frac{8}{41} \\ \frac{15}{41} \\ \hline \end{array}$$

e. $$\begin{array}{r} \frac{10}{30} \\ \frac{10}{30} \\ \hline \end{array}$$

f. $$\begin{array}{r} \frac{7}{29} \\ \frac{15}{29} \\ \hline \end{array}$$

g. $$\begin{array}{r} \frac{6}{12} \\ \frac{4}{12} \\ \hline \end{array}$$

h. $$\begin{array}{r} \frac{5}{10} \\ \frac{2}{10} \\ \hline \end{array}$$

i. $$\begin{array}{r} \frac{23}{48} \\ \frac{11}{48} \\ \hline \end{array}$$

j. $$\begin{array}{r} \frac{50}{100} \\ \frac{36}{100} \\ \hline \end{array}$$

k. $$\begin{array}{r} \frac{6}{12} \\ \frac{3}{12} \\ \frac{1}{12} \\ \hline \end{array}$$

l. $$\begin{array}{r} \frac{4}{10} \\ \frac{3}{10} \\ \frac{6}{10} \\ \hline \end{array}$$

$$\begin{array}{llllll} \text{m.} & \frac{3}{5} & \text{n.} & \frac{7}{12} & \text{o.} & \frac{7}{5} \\ & \frac{2}{5} & & \frac{5}{12} & & \frac{3}{5} \\ & \underline{\frac{1}{5}} & & \underline{\frac{9}{12}} & & \underline{\frac{4}{5}} \end{array}$$

ADDITION OF FRACTIONS
UNIT II

ASSIGNMENT SHEET #2--ADD MIXED NUMBERS WITH LIKE DENOMINATORS.

Directions: Add. Reduce to the lowest terms.

a. $\begin{array}{r} 5\frac{3}{8} \\ 6\frac{1}{8} \\ \hline \end{array}$

b. $\begin{array}{r} 3\frac{5}{7} \\ 5\frac{3}{7} \\ \hline \end{array}$

c. $\begin{array}{r} 10\frac{5}{6} \\ 1\frac{2}{6} \\ \hline \end{array}$

d. $\begin{array}{r} 2\frac{5}{9} \\ 3\frac{4}{9} \\ \hline \end{array}$

e. $\begin{array}{r} 3\frac{5}{9} \\ 1\frac{2}{9} \\ \hline \end{array}$

f. $\begin{array}{r} 50\frac{15}{16} \\ 11\frac{7}{16} \\ \hline \end{array}$

g. $\begin{array}{r} 22\frac{9}{10} \\ 1\frac{8}{10} \\ \hline \end{array}$

h. $\begin{array}{r} 5\frac{3}{4} \\ 9\frac{1}{4} \\ \hline \end{array}$

i. $\begin{array}{r} 20\frac{7}{8} \\ 12\frac{5}{8} \\ \hline \end{array}$

j. $\begin{array}{r} 3\frac{3}{5} \\ \underline{8\frac{1}{5}} \end{array}$

k. $\begin{array}{r} 14\frac{9}{10} \\ \underline{3\frac{7}{10}} \end{array}$

l. $\begin{array}{r} 2\frac{75}{100} \\ \underline{1\frac{25}{100}} \end{array}$

m. $\begin{array}{r} 5\frac{3}{4} \\ \underline{2\frac{2}{4}} \end{array}$

n. $\begin{array}{r} 8\frac{11}{12} \\ \underline{3\frac{6}{12}} \end{array}$

o. $\begin{array}{r} 7\frac{2}{5} \\ \underline{3\frac{1}{5}} \end{array}$

p. $\begin{array}{r} 5\frac{3}{5} \\ \underline{6\frac{1}{5}} \end{array}$

q. $\begin{array}{r} 3\frac{5}{6} \\ \underline{4\frac{2}{6}} \end{array}$

r. $\begin{array}{r} 5\frac{7}{8} \\ \underline{3\frac{3}{8}} \end{array}$

s. $\begin{array}{r} 11\frac{12}{20} \\ \underline{12\frac{8}{20}} \end{array}$

t. $\begin{array}{r} 5\frac{5}{6} \\ \underline{6\frac{1}{6}} \end{array}$

ADDITION OF FRACTIONS
UNIT II

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

a. $\frac{5}{9}$ b. $\frac{13}{25}$ c. $\frac{5}{6}$ d. $\frac{23}{41}$ e. $\frac{2}{3}$

f. $\frac{22}{29}$ g. $\frac{5}{6}$ h. $\frac{7}{10}$ i. $\frac{17}{24}$ j. $\frac{43}{50}$

k. $\frac{5}{6}$ l. $1\frac{3}{10}$ m. $1\frac{1}{5}$ n. $1\frac{3}{4}$ o. $2\frac{4}{5}$

ASSIGNMENT SHEET #2

a. $11\frac{1}{2}$ b. $9\frac{1}{7}$ c. $12\frac{1}{6}$ d. 6

e. $4\frac{7}{9}$ f. $62\frac{3}{8}$ g. $24\frac{7}{10}$ h. 15

i. $33\frac{1}{2}$ j. $11\frac{4}{5}$ k. $18\frac{3}{5}$ l. 4

m. $8\frac{1}{4}$ n. $12\frac{5}{12}$ o. $10\frac{3}{5}$ p. $11\frac{4}{5}$

q. $8\frac{1}{6}$ r. $9\frac{1}{4}$ s. 24 t. 12

ADDITION OF FRACTIONS
UNIT II

TEST

Directions: Add. Reduce to the lowest terms if possible.

1. a. $\begin{array}{r}\frac{2}{6}\\ \underline{\frac{3}{6}}\end{array}$

b. $\begin{array}{r}\frac{5}{10}\\ \underline{\frac{2}{10}}\end{array}$

c. $\begin{array}{r}\frac{6}{12}\\ \underline{\frac{4}{12}}\end{array}$

d. $\begin{array}{r}\frac{50}{100}\\ \underline{\frac{36}{100}}\end{array}$

e. $\begin{array}{r}\frac{10}{30}\\ \underline{\frac{10}{30}}\end{array}$

f. $\begin{array}{r}\frac{21}{50}\\ \underline{\frac{5}{50}}\end{array}$

g. $\begin{array}{r}\frac{2}{3}\\ \underline{\frac{8}{3}}\end{array}$

h. $\begin{array}{r}\frac{5}{8}\\ \underline{\frac{7}{8}}\end{array}$

i. $\begin{array}{r}\frac{6}{12}\\ \frac{3}{12}\\ \underline{\frac{1}{12}}\end{array}$

j. $\begin{array}{r}\frac{3}{5}\\ \frac{2}{5}\\ \underline{\frac{1}{5}}\end{array}$

2. a. $\begin{array}{r} 3\frac{5}{7} \\ \underline{5\frac{3}{7}} \end{array}$ b. $\begin{array}{r} 3\frac{3}{5} \\ \underline{8\frac{1}{5}} \end{array}$ c. $\begin{array}{r} 5\frac{3}{5} \\ \underline{6\frac{1}{5}} \end{array}$ d. $\begin{array}{r} 7\frac{2}{5} \\ \underline{3\frac{1}{5}} \end{array}$

e. $\begin{array}{r} 6\frac{3}{5} \\ \underline{4\frac{1}{5}} \end{array}$ f. $\begin{array}{r} 3\frac{5}{9} \\ \underline{1\frac{2}{9}} \end{array}$ g. $\begin{array}{r} 5\frac{6}{12} \\ \underline{1\frac{4}{12}} \end{array}$ h. $\begin{array}{r} 3\frac{2}{3} \\ \underline{1\frac{1}{3}} \end{array}$

i. $\begin{array}{r} 5\frac{5}{6} \\ \underline{6\frac{1}{6}} \end{array}$ j. $\begin{array}{r} 8\frac{11}{12} \\ \underline{3\frac{6}{12}} \end{array}$

ADDITION OF FRACTIONS
UNIT II

ANSWERS TO TEST

1. a. $\frac{5}{6}$
   b. $\frac{7}{10}$
   c. $\frac{5}{6}$
   d. $\frac{43}{50}$
   e. $\frac{2}{3}$
   f. $\frac{13}{25}$
   g. $3\frac{1}{3}$
   h. $1\frac{1}{2}$
   i. $\frac{5}{6}$
   j. $1\frac{1}{5}$

2. a. $9\frac{1}{7}$
   b. $11\frac{4}{5}$
   c. $11\frac{4}{5}$
   d. $10\frac{3}{5}$
   e. $10\frac{4}{5}$
   f. $4\frac{7}{9}$
   g. $6\frac{5}{6}$
   h. 5
   i. 12
   j. $12\frac{5}{12}$

SUBTRACTION OF FRACTIONS
UNIT III

UNIT OBJECTIVE

After completion of this unit, the student should be able to subtract fractions with like denominators. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by successfully scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit of instruction, the student will be able to:

1. Subtract fractions with like denominators.
2. Subtract whole numbers from mixed numbers.
3. Subtract mixed numbers from whole numbers.
4. Subtract mixed numbers from mixed numbers.

SUBTRACTION OF FRACTIONS
UNIT III

INFORMATION SHEET

I. Subtracting mixed numbers with like denominators

A. Subract the bottom numerator from the top numerator.

(NOTE: The denominators are unaffected by addition or subtraction.)

Example:

$$\begin{array}{r} \frac{3}{4} \\ -\ \frac{2}{4} \\ \hline \frac{1}{4} \end{array}$$

B. Subract the bottom whole number from the top number. Reduce the answer to its lowest terms.

Example:

$$\begin{array}{r} 3\ \frac{6}{8} \\ 1\ \frac{2}{8} \\ \hline 2\ \frac{4}{8} \end{array} = 2\ \frac{1}{2}$$

II. Subtraction of whole numbers from mixed numbers

Example:

$$\begin{array}{r} 15\ \frac{3}{4} \\ -\ 2\phantom{\frac{3}{4}} \\ \hline \end{array}$$

A. Subtract 0 from the fraction. Record the fraction in the answer.

Example:

$$\begin{array}{r} 15\ \frac{3}{4} \\ -\ 2\phantom{\frac{3}{4}} \\ \hline \frac{3}{4} \end{array} \text{ partial answer}$$

B. Subtract the whole numbers as usual.

Example:

$$\begin{array}{r} 15\ \frac{3}{4} \\ -\ 2\phantom{\ \frac{3}{4}} \\ \hline 13\ \frac{3}{4} \end{array}$$

III. Subtraction of mixed numbers from whole numbers

Example:

$$\begin{array}{r} 25\phantom{\ \frac{2}{3}} \\ -13\ \frac{2}{3} \\ \hline \end{array}$$

A. Borrow 1 from the ones column of the numeral because there is no fraction from which to subtract 2/3.

Example:

$$\begin{array}{l} 24 + 1 \text{ whole number} \\ -13\ \frac{2}{3} \\ \hline \end{array}$$

B. Rewrite the borrowed whole number as a fraction using the denominator of the subtrahend to determine the fraction name.

Example:

$$\begin{array}{lr} 24 + 1 \text{ whole} & = 24\ \frac{3}{3} \\ 13\ \frac{2}{3} & = 13\ \frac{2}{3} \end{array}$$

C. Subtract as usual

Example:

$$\begin{array}{r} 24\ \frac{3}{3} \\ -13\ \frac{2}{3} \\ \hline 11\ \frac{1}{3} \end{array}$$

IV. Subtraction of mixed numbers from mixed numbers.

A. If the bottom numerator of the fraction is larger than the top numerator of the frction, borrow a whole number in the top mixed number and rewrite it as a fraction; then add it to the existing top fraction.

Example:
$$\begin{array}{rcr} 2\frac{1}{3} & = & 1\frac{4}{3} \\ \underline{1\frac{2}{3}} & = & \underline{1\frac{2}{3}} \\ & & \frac{2}{3} \end{array}$$

SUBTRACTION OF FRACTIONS
UNIT III

ASSIGNMENT SHEET #1--SUBTRACTION OF LIKE FRACTIONS

Directions: Subtract like fractions. Reduce the difference to the lowest terms if possible.

Example:

$$\begin{array}{r}\frac{15}{25}\\ -\,\frac{10}{25}\\ \hline \frac{5}{25}=\frac{1}{5}\end{array}$$

$$\text{a. }\begin{array}{r}\frac{30}{32}\\ -\,\frac{12}{32}\\ \hline\end{array}\qquad \text{b. }\begin{array}{r}\frac{4}{5}\\ -\,\frac{1}{5}\\ \hline\end{array}\qquad \text{c. }\begin{array}{r}\frac{5}{6}\\ -\,\frac{2}{6}\\ \hline\end{array}\qquad \text{d. }\begin{array}{r}\frac{100}{225}\\ -\,\frac{99}{225}\\ \hline\end{array}\qquad \text{e. }\begin{array}{r}\frac{51}{60}\\ -\,\frac{20}{60}\\ \hline\end{array}$$

$$\text{f. }\begin{array}{r}\frac{20}{35}\\ -\,\frac{15}{35}\\ \hline\end{array}\qquad \text{g. }\begin{array}{r}\frac{3}{4}\\ -\,\frac{1}{4}\\ \hline\end{array}\qquad \text{h. }\begin{array}{r}\frac{7}{8}\\ -\,\frac{3}{8}\\ \hline\end{array}\qquad \text{i. }\begin{array}{r}\frac{56}{80}\\ -\,\frac{24}{80}\\ \hline\end{array}\qquad \text{j. }\begin{array}{r}\frac{5}{9}\\ -\,\frac{3}{9}\\ \hline\end{array}$$

$$\text{k. }\begin{array}{r}\frac{12}{15}\\ -\,\frac{7}{15}\\ \hline\end{array}\qquad \text{l. }\begin{array}{r}\frac{10}{25}\\ -\,\frac{5}{25}\\ \hline\end{array}\qquad \text{m. }\begin{array}{r}\frac{25}{64}\\ -\,\frac{9}{64}\\ \hline\end{array}\qquad \text{n. }\begin{array}{r}\frac{75}{200}\\ -\,\frac{25}{200}\\ \hline\end{array}\qquad \text{o. }\begin{array}{r}\frac{5}{6}\\ -\,\frac{2}{6}\\ \hline\end{array}$$

SUBTRACTION OF FRACTIONS
UNIT III

ASSIGNMENT SHEET #2--SUBTRACT WHOLE NUMBERS FROM MIXED NUMBERS

Directions: Subtract.

a. $\begin{array}{r} 5\frac{2}{3} \\ -\ 3 \\ \hline \end{array}$ b. $\begin{array}{r} 8\frac{5}{8} \\ -\ 3 \\ \hline \end{array}$ c. $\begin{array}{r} 15\frac{3}{5} \\ -\ 11 \\ \hline \end{array}$ d. $\begin{array}{r} 3\frac{2}{5} \\ -\ 1 \\ \hline \end{array}$

e. $\begin{array}{r} 102\frac{31}{36} \\ -\ 99 \\ \hline \end{array}$ f. $\begin{array}{r} 99\frac{5}{8} \\ -\ 11 \\ \hline \end{array}$ g. $\begin{array}{r} 8\frac{7}{8} \\ -\ 3 \\ \hline \end{array}$ h. $\begin{array}{r} 5\frac{20}{43} \\ -\ 2 \\ \hline \end{array}$

i. $\begin{array}{r} 93\frac{5}{16} \\ -\ 11 \\ \hline \end{array}$ j. $\begin{array}{r} 83\frac{24}{25} \\ -\ 10 \\ \hline \end{array}$ k. $\begin{array}{r} 3\frac{1}{3} \\ -\ 2 \\ \hline \end{array}$ l. $\begin{array}{r} 15\frac{3}{4} \\ -\ 11 \\ \hline \end{array}$

m. $\begin{array}{r} 16\frac{3}{5} \\ -\ 11 \\ \hline \end{array}$ n. $\begin{array}{r} 18\frac{8}{17} \\ -\ 3 \\ \hline \end{array}$ o. $\begin{array}{r} 19\frac{7}{9} \\ -\ 6 \\ \hline \end{array}$ p. $\begin{array}{r} 7\frac{29}{32} \\ -\ 2 \\ \hline \end{array}$

q. $\begin{array}{r} 5\frac{2}{3} \\ -\ 1 \\ \hline \end{array}$ r. $\begin{array}{r} 7\frac{5}{8} \\ -\ 3 \\ \hline \end{array}$ s. $\begin{array}{r} 8\frac{7}{15} \\ -\ 4 \\ \hline \end{array}$ t. $\begin{array}{r} 9\frac{8}{21} \\ -\ 3 \\ \hline \end{array}$

SUBTRACTION OF FRACTIONS
UNIT III

ASSIGNMENT SHEET #3--SUBTRACT MIXED NUMBERS FROM WHOLE NUMBERS

Directions: Subtract. Reduce to the lowest terms.

a. $\begin{array}{r} 8 \\ -\ 2\frac{3}{4} \\ \hline \end{array}$

b. $\begin{array}{r} 7 \\ -\ 3\frac{7}{8} \\ \hline \end{array}$

c. $\begin{array}{r} 12 \\ -\ 5\frac{9}{13} \\ \hline \end{array}$

d. $\begin{array}{r} 15 \\ -\ 1\frac{7}{12} \\ \hline \end{array}$

e. $\begin{array}{r} 10 \\ -\ 5\frac{5}{31} \\ \hline \end{array}$

f. $\begin{array}{r} 9 \\ -\ 6\frac{3}{8} \\ \hline \end{array}$

g. $\begin{array}{r} 102 \\ -\ 3\frac{10}{17} \\ \hline \end{array}$

h. $\begin{array}{r} 85 \\ -\ 2\frac{2}{15} \\ \hline \end{array}$

i. $\begin{array}{r} 23 \\ -\ 11\frac{5}{9} \\ \hline \end{array}$

j. $\begin{array}{r} 20 \\ -\ 5\frac{11}{16} \\ \hline \end{array}$

k. $\begin{array}{r} 18 \\ -\ 3\frac{4}{9} \\ \hline \end{array}$

l. $\begin{array}{r} 7 \\ -\ 5\frac{2}{3} \\ \hline \end{array}$

m. $\begin{array}{r} 105 \\ -\ 11\frac{4}{9} \\ \hline \end{array}$

n. $\begin{array}{r} 76 \\ -\ 2\frac{5}{11} \\ \hline \end{array}$

o. $\begin{array}{r} 9 \\ -\ 2\frac{1}{2} \\ \hline \end{array}$

p. $\begin{array}{r} 10 \\ -\ 7\frac{8}{9} \\ \hline \end{array}$

q. $\begin{array}{r} 5 \\ -\ 1\frac{2}{3} \\ \hline \end{array}$

r. $\begin{array}{r} 201 \\ -\ 22\frac{20}{21} \\ \hline \end{array}$

s. $\begin{array}{r} 76 \\ -\ 5\frac{3}{4} \\ \hline \end{array}$

t. $\begin{array}{r} 708 \\ -\ 6\frac{9}{10} \\ \hline \end{array}$

SUBTRACTION OF FRACTIONS
UNIT III

ASSIGNMENT SHEET #4--SUBTRACT MIXED NUMBERS FROM MIXED NUMBERS

Directions: Subtract. Reduce to the lowest terms.

a. $\begin{array}{r} 8\frac{4}{5} \\ -2\frac{3}{5} \\ \hline \end{array}$

b. $\begin{array}{r} 3\frac{15}{16} \\ -1\frac{10}{16} \\ \hline \end{array}$

c. $\begin{array}{r} 13\frac{6}{8} \\ -5\frac{3}{8} \\ \hline \end{array}$

d. $\begin{array}{r} 125\frac{7}{15} \\ -113\frac{4}{15} \\ \hline \end{array}$

e. $\begin{array}{r} 14\frac{9}{9} \\ -11\frac{6}{9} \\ \hline \end{array}$

f. $\begin{array}{r} 5\frac{17}{32} \\ -1\frac{13}{32} \\ \hline \end{array}$

g. $\begin{array}{r} 8\frac{59}{64} \\ -4\frac{41}{64} \\ \hline \end{array}$

h. $\begin{array}{r} 47\frac{7}{10} \\ -13\frac{3}{10} \\ \hline \end{array}$

i. $\begin{array}{r} 8\frac{3}{8} \\ -2\frac{7}{8} \\ \hline \end{array}$

j. $\begin{array}{r} 10\frac{3}{16} \\ -5\frac{13}{16} \\ \hline \end{array}$

k. $\begin{array}{r} 10\frac{1}{2} \\ -2\frac{1}{2} \\ \hline \end{array}$

l. $\begin{array}{r} 23\frac{4}{8} \\ -6\frac{3}{8} \\ \hline \end{array}$

m. $\begin{array}{r} 4\frac{16}{32} \\ -3\frac{17}{32} \\ \hline \end{array}$

n. $\begin{array}{r} 19\frac{3}{8} \\ -18\frac{5}{8} \\ \hline \end{array}$

o. $\begin{array}{r} 41\frac{7}{64} \\ -33\frac{43}{64} \\ \hline \end{array}$

p. $\begin{array}{r} 45\frac{17}{100} \\ -17\frac{29}{100} \\ \hline \end{array}$

q. $\begin{array}{r} 58\frac{179}{1000} \\ -21\frac{329}{1000} \\ \hline \end{array}$

r. $\begin{array}{r} 200\frac{2}{3} \\ -109\frac{3}{3} \\ \hline \end{array}$

s. $\begin{array}{r} 10\frac{5}{17} \\ -3\frac{10}{17} \\ \hline \end{array}$

t. $\begin{array}{r} 11\frac{24}{128} \\ -5\frac{64}{128} \\ \hline \end{array}$

SUBTRACTION OF FRACTIONS
UNIT III

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

a. $\frac{9}{16}$
b. $\frac{3}{5}$
c. $\frac{1}{2}$
d. $\frac{1}{225}$
e. $\frac{31}{60}$
f. $\frac{1}{7}$
g. $\frac{1}{2}$
h. $\frac{1}{2}$
i. $\frac{2}{5}$
j. $\frac{2}{9}$
k. $\frac{1}{3}$
l. $\frac{1}{5}$
m. $\frac{1}{4}$
n. $\frac{1}{4}$
o. $\frac{1}{2}$

ASSIGNMENT SHEET #2

a. $2\frac{2}{3}$
b. $5\frac{5}{8}$
c. $4\frac{3}{5}$
d. $2\frac{2}{5}$
e. $3\frac{31}{36}$
f. $88\frac{5}{8}$
g. $5\frac{7}{8}$
h. $3\frac{20}{43}$
i. $82\frac{5}{16}$
j. $73\frac{24}{25}$
k. $1\frac{1}{3}$
l. $4\frac{3}{4}$
m. $5\frac{3}{5}$
n. $15\frac{8}{17}$
o. $13\frac{7}{9}$
p. $5\frac{29}{32}$
q. $4\frac{2}{3}$
r. $4\frac{5}{8}$
s. $4\frac{7}{15}$
t. $6\frac{8}{21}$

ASSIGNMENT SHEET #3

a. $5\frac{1}{4}$
b. $3\frac{1}{8}$
c. $6\frac{4}{13}$
d. $13\frac{5}{12}$
e. $4\frac{26}{31}$
f. $2\frac{5}{8}$
g. $98\frac{7}{17}$
h. $82\frac{13}{15}$
i. $11\frac{4}{9}$
j. $14\frac{5}{16}$
k. $14\frac{5}{9}$
l. $1\frac{1}{3}$
m. $93\frac{5}{9}$
n. $73\frac{6}{11}$
o. $6\frac{1}{2}$
p. $2\frac{1}{9}$
q. $3\frac{1}{3}$
r. $178\frac{1}{21}$
s. $70\frac{1}{4}$
t. $701\frac{1}{10}$

ASSIGNMENT SHEET #4

a. $6\frac{1}{5}$

b. $2\frac{5}{16}$

c. $8\frac{3}{8}$

d. $12\frac{1}{5}$

e. $3\frac{1}{3}$

f. $4\frac{1}{8}$

g. $4\frac{18}{64}$ or $4\frac{9}{32}$

h. $34\frac{2}{5}$

i. $5\frac{1}{2}$

j. $4\frac{6}{16}$ or $4\frac{3}{8}$

k. 8

l. $17\frac{1}{8}$

m. $\frac{31}{32}$

n. $\frac{6}{8}$ or $\frac{3}{4}$

o. $7\frac{7}{16}$

p. $27\frac{22}{25}$

q. $36\frac{9}{10}$

r. $90\frac{2}{3}$

s. $6\frac{12}{17}$

t. $5\frac{11}{16}$

SUBTRACTION OF FRACTIONS
UNIT III

ANSWERS TO TEST

1. a. $\frac{3}{5}$
   b. $\frac{31}{60}$
   c. $\frac{1}{2}$
   d. $\frac{1}{3}$
   e. $\frac{1}{2}$
   f. $\frac{1}{2}$
   g. $\frac{1}{2}$
   h. $\frac{1}{4}$

2. a. $5 \frac{5}{8}$
   b. $1 \frac{1}{3}$
   c. $15 \frac{8}{17}$
   d. $18 \frac{2}{3}$
   e. $6 \frac{8}{21}$
   f. $6 \frac{3}{4}$

3. a. $3 \frac{1}{8}$
   b. $14 \frac{5}{16}$
   c. $70 \frac{1}{4}$
   d. $2 \frac{1}{3}$
   e. $6 \frac{1}{2}$
   f. $2 \frac{5}{8}$

4. a. $24\frac{1}{5}$ b. $5\frac{1}{2}$ c. $18\frac{7}{8}$

d. $42\frac{9}{40}$

MIXED ADDITION AND SUBTRACTION OF FRACTIONS
UNIT IV

UNIT OBJECTIVE

After completion of this unit, the student should be able to add and subtract fractions with like denominators. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by successfully scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of the unit, the student should be able to:

1. Define the operation needed to solve a given problem as indicated by a symbol or term.
2. Solve a given problem by using the addition or subtraction operation indicated by a symbol or term.

MIXED ADDITION AND SUBTRACTION OF FRACTIONS
UNIT IV

INFORMATION SHEET

I. Terms and Definitions

A. Addition--Combining together, indicated by the symbol + or by terms such as plus, add, find the sum, or find the total.

B. Subtraction--Taking away, indicated by the symbol - or by terms such as subtract, minus, take away, or find the difference.

II. Procedures

A. Determine operational symbol or word.

B. Apply operational procedure.

MIXED ADDITION AND SUBTRACTION OF FRACTIONS
UNIT IV

ASSIGNMENT SHEET #1--DEFINE TERMS AND SYMBOLS FOR ADDITION AND SUBTRACTION.

Directions: Match the following directions or symbols with the letter of the correct operation.

1. Sum_____
2. Minus_____
3. Difference_____
4. Add_____
5. Subtract_____
6. Take away_____
7. Plus_____
8. + _____
9. - _____
10. Total_____

a. Addition

b. Subtraction

MIXED ADDITION AND SUBTRACTION OF FRACTIONS
UNIT IV

ASSIGNMENT SHEET #2--SOLVE MIXED ADDITION AND SUBTRACTION PROBLEMS INVOLVING FRACTIONS.

Directions: Solve the following fraction problems by performing the operation indicated by the given symbol or description.

1. Find the total:

a. $\begin{array}{r} \frac{1}{5} \\ \underline{\frac{2}{5}} \end{array}$ b. $\begin{array}{r} 1\frac{1}{3} \\ \underline{\frac{1}{3}} \end{array}$ c. $\begin{array}{r} \frac{4}{6} \\ \underline{\frac{1}{6}} \end{array}$ d. $\begin{array}{r} 7\frac{28}{30} \\ \underline{2\frac{1}{30}} \end{array}$

2. Find the difference:

a. $\begin{array}{r} \frac{2}{5} \\ \underline{\frac{1}{5}} \end{array}$ b. $\begin{array}{r} \frac{60}{70} \\ \underline{\frac{1}{70}} \end{array}$ c. $\begin{array}{r} 8\frac{33}{40} \\ \underline{5\frac{2}{40}} \end{array}$ d. $\begin{array}{r} 7\frac{5}{8} \\ \underline{\frac{2}{8}} \end{array}$

3. a. $\frac{1}{3}$ plus $\frac{1}{3}$ =

b. $\frac{6}{8}$ minus $\frac{1}{8}$ =

c. $\frac{3}{5}$ take away $\frac{2}{5}$ =

d. $2\frac{2}{8}$ and $\frac{1}{8}$ total

4. a. Add $\frac{1}{20}$ and $\frac{2}{20}$ =

b. $\frac{3}{8} + \frac{2}{8} =$

c. $\frac{4}{8} - \frac{1}{8} =$

d. $\frac{12}{15}$ minus $\frac{1}{15}$ =

MIXED ADDITION AND SUBTRACTION OF FRACTIONS
UNIT IV

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

1. a
2. b
3. b
4. a
5. b
6. b
7. a
8. a
9. b
10. a

ASSIGNMENT SHEET #2

1. a. $\frac{3}{5}$
   b. $1\frac{2}{3}$
   c. $\frac{5}{6}$
   d. $9\frac{29}{30}$
2. a. $\frac{1}{5}$
   b. $\frac{59}{70}$
   c. $3\frac{31}{40}$
   d. $7\frac{3}{8}$
3. a. $\frac{2}{3}$
   b. $\frac{5}{8}$
   c. $\frac{1}{5}$
   d. $2\frac{3}{8}$
4. a. $\frac{3}{20}$
   b. $\frac{5}{8}$
   c. $\frac{3}{8}$
   d. $\frac{11}{15}$

MIXED ADDITION AND SUBTRACTION OF FRACTIONS
UNIT IV

TEST

Directions: Match the following terms or definitions with the appropriate sign, - or +. Place the sign in the blank.

1.

_____a. take away

_____b. find the sum

_____c. find the difference

_____d. minus

_____e. combining together

_____f. addition

_____g. subtraction

_____h. find the total

_____i. plus

_____j. subtract

Directions: Solve the problem as indicated by the given symbol. Reduce if possible.

2.

a. $\begin{array}{r} 5 \\ -\frac{2}{3} \\ \hline \end{array}$

b. $\begin{array}{r} \frac{7}{14} \\ +\frac{3}{14} \\ \hline \end{array}$

c. $\begin{array}{r} 7\frac{2}{3} \\ -3\frac{1}{3} \\ \hline \end{array}$

d. $\begin{array}{r} 6\frac{20}{25} \\ -1\frac{10}{25} \\ \hline \end{array}$

e. $\begin{array}{r} \frac{3}{8} \\ + \frac{2}{8} \\ \hline \end{array}$

f. $\begin{array}{r} \frac{33}{40} \\ - \frac{2}{40} \\ \hline \end{array}$

g. $\begin{array}{r} 55\ \frac{5}{8} \\ - 50\ \frac{3}{8} \\ \hline \end{array}$

h. $\begin{array}{r} \frac{4}{6} \\ + \frac{1}{6} \\ \hline \end{array}$

i. $\frac{3}{5} - \frac{2}{5} =$ ________

j. $\frac{4}{8} - \frac{1}{8} =$ ________

MIXED ADDITION AND SUBTRACTION OF FRACTIONS
UNIT IV

ANSWERS TO TEST

Matching:

1. a. -
   b. +
   c. -
   d. -
   e. +
   f. +
   g. -
   n. +
   i. +
   j. -

Solving:

2. a. $4\frac{1}{3}$
   b. $\frac{5}{7}$
   c. $4\frac{1}{3}$
   d. $5\frac{2}{5}$
   e. $\frac{5}{8}$
   f. $\frac{31}{40}$
   g. $5\frac{1}{4}$
   h. $\frac{5}{6}$
   i. $\frac{1}{5}$
   j. $\frac{3}{8}$

DECIMAL NOTATION
UNIT I

UNIT OBJECTIVE

After completion of this unit, the student should be able to specify decimal names and notation. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit of instruction, the student will be able to:

1. Specify decimal names for given decimal numbers.
2. Write decimal numbers for given decimal names.

DECIMAL NOTATION
UNIT I

SUGGESTED ACTIVITIES

I. Make transparency.

II. Provide student with objective sheet.

III. Provide student with information and assignment sheets.

IV. Discuss unit and specific objectives.

V. Discuss information and assignment sheets.

VI. Illustrate decimal place values with transparency.

VII. Assist students as they work through assignment sheets.

VIII. Give test.

IX. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

   A. Objective sheet

   B. Information sheet

   C. Transparency master--Decimal Place Value Chart

   D. Assignment sheets-

      1. Assignment Sheet #1--Read decimals

      2. Assignment Sheet #2--Write decimals

   E. Answers to assignment sheets

   F. Test

   G. Answers to test

II. References:

A. Glenn, Euel D. and David H. Wiltsie. Success in Mathematics, Part I. Bishop, CA 93514: Motivation Development, Inc., 1981.

B. Shea, James T. Basic Essentials of Math, Part I, 2nd Ed. Austin, TX 78768: Steck-Vaughn Co., 1980.

C. Smith, Robert D. Applied General Mathematics. Albany, NY 12205: Delmar Publishing Co., 1983.

DECIMAL PLACE VALUES

•DECIMAL POINT

TENTHS

HUNDREDTHS

THOUSANDTHS

TEN-THOUSANDTHS

HUNDRED-THOUSANDTHS

MILLIONTHS

PTM - 5-C

DECIMAL NOTATION
UNIT I

INFORMATION SHEET

I. Terms and Definitions

A. Decimal Fraction--A fractional number with an unwritten denominator of 10, or some power of 10, indicated by a point (.) before the numerator.

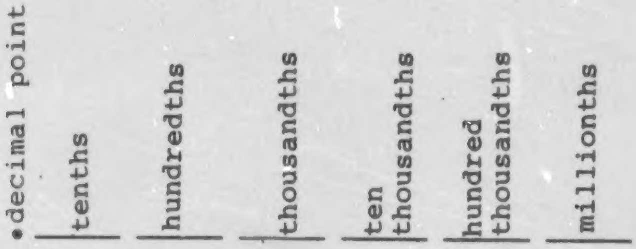
B. Decimal Point--A symbol (.) used to indicate a decimal fraction; read as "and" in whole number/decimal fraction expressions. (A decimal comma (,) is used in countries that use the metric system.)

(NOTE: In industry, using the word "point" for verbal expression is much more common. Thus one and five tenths would probably be said, "one point five.")

C. Mixed Decimals--Numbers with digits on both sides of the decimal point. This indicates both whole numbers and decimal fractions.

II. Decimal Place Values

(NOTE: Decimal place values move from left to right away from the decimal point. The names of decimal place values end in ths.)



III. Reading Decimals--A decimal gets its name from its positional relationship to the decimal point. To read a decimal, count the places away from the decimal point.

Example: 0.362

A. Read the numeral name. In this case, three hundred sixty-two.

B. Determine the place value name. In this case, three places from the decimal point indicates that the place value name is thousandths.

C. Combine the numeral name with the place value name to complete reading the decimal.

Examples: 0.362 is three hundred sixty-two thousandths

0.15 is fifteen hundredths

0.0056 is fifty-six ten thousandths

IV. Writing Decimals--To write a decimal, decide how many decimal places will be needed. Use zeros as place holders in places not filled.

Example: Write six thousandths as a decimal.

A. Six thousandths requires three places.

Example: .___ ___ ___

B. Write the numeral in the place(s) nearest the right.

Example: .___ ___ 6

C. Fill in the places without numbers with zero(s).

Example: 0.006 This means the same as $\frac{6}{1000}$

(NOTE: The numeral tells how many decimal fractional parts you have. The place value tells how many parts into which the whole has been divided.)

V. Writing Mixed Decimals--Use a decimal point (.) for the word "and" to write mixed decimals.

Example: Write twenty-four and 2 hundredths.

A. Write the whole number.

Example: 24

B. Write a decimal point for the word "and".

Example: 24.

C. Write the decimal fraction in its correct place.

Example: 24.02 In this case, hundredths needs two places.

DECIMAL NOTATION
UNIT I

ASSIGNMENT SHEET #1--READ DECIMALS

Directions: Match the word numbers in column 2 with the correct decimal listed in column 1. You will need to put the letter from column 2 in the correct blank beside column 1.

Column 1	Column 2
______(1) 0.3	a. thirty-seven hundredths
______(2) 0.7	b. three and five hundredths
______(3) 0.04	c. seven tenths
______(4) 0.09	d. eighty-nine hundredths
______(5) 0.10	e. five thousandths
______(6) 0.23	f. three and three tenths
______(7) 0.37	g. eleven and forty-one hundredths
______(8) 0.033	h. four hundredths
______(9) 0.60	i. ten hundredths
______(10) 0.89	j. one and fifty-six thousandths
______(11) 0.005	k. three tenths
______(12) 0.151	l. seven and five tenths
______(13) 0.13	m. twenty-three hundredths

______(14) 3.05

______(15) 1.056

______(16) 7.5

______(17) 10.1

______(18) 5.003

______(19) 11.41

______(20) 0.033

______(21) 3.03

______(22) 13.908

______(23) 3.3

n. thirty-three hundredths

o. one hundred fifty-one thousandths

p. one and thirteen hundredths

q. six tenths(sixty hundredths)

r. three and three hundredths

s. thirteen and nine hundred eight thousandths

t. ten and one tenth

u. nine hundredths

v. thirty-three thousandths

w. five and three thousandths

DECIMAL NOTATION
UNIT I

ASSIGNMENT SHEET #2--WRITE DECIMALS

Directions: Write the name of the decimal from column 1 in the blank in column 2.

Column 1	Column 2
a. 0.05	five hundredths
b. 0.361	
c. 0.004	
d. 0.506	
e. 0.001	
f. 0.1	
g. 0.101	
h. 0.2005	
i. 3.05	
j. 54.54	
k. 0.70	
l. 0.456	
m. 0.070	
n. 1.021	
o. 10.01	
p. 0.200	
q. 4.143	
r. 125.058	

DECIMAL NOTATION
UNIT I

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

1. k
2. c
3. h
4. u
5. i
6. m
7. a
8. v
9. q
10. d
11. e
12. o
13. p
14. b
15. j
16. l
17. t
18. w
19. g
20. v
21. r
22. s
23. f

ASSIGNMENT SHEET #2

a. five hundredths

b. three hundred sixty-one thousandths

c. four thousandths

d. five hundred six thousandths

e. one thousandth

f. one tenth

g. one hundred one thousandths

h. two thousand five ten-thousandths

i. three and five hundredths

j. fifty-four and fifty-four hundredths

k. seventy hundredths

l. four hundred fifty-six thousandths

m. seventy thousandths

n. one and twenty-one thousandths

o. ten and one hundredth

p. two hundred thousandths or two tenths

q. four and one hundred forty-three thousandths

r. one hundred twenty-five and fifty-eight thousandths

DECIMAL NOTATION
UNIT I

TEST

Directions: In the space provided write the decimal name for the given decimal number.

1. a. 0.4 ______________________________

   b. 0.8 ______________________________

   c. 0.01 ______________________________

   d. 0.073 ______________________________

   e. 0.60 ______________________________

   f. 0.151 ______________________________

   g. 1.13 ______________________________

   h. 0.03 ______________________________

   i. 3.05 ______________________________

   j. 10.7 ______________________________

   k. 0.224 ______________________________

   l. 2.25 ______________________________

   m. 0.22 ______________________________

   n. 11.304 ______________________________

   o. 0.709 ______________________________

Directions: In the space provided write the decimal number for the given decimal name.

2. a. five tenths __________

   b. seventy hundredths __________

   c. three hundred sixty-two thousandths __________

   d. eight hundred thirty thousandths __________

   e. five and six thousandths __________

f. three and forty-eight hundredths ________

g. nine hundred seventy-eight thousandths ________

h. thirteen and sixty hundredths ________

i. five thousandths ________

j. ten thousandths ________

k. fourteen and eight hundred thirty-three thousandths ________

l. nine and eighty-three thousandths ________

m. sixty-eight and five hundred eighty-two thousandths ________

n. forty and four thousandths ________

o. one hundred thirty-seven and two hundred thirty-eight thousandths ________

DECIMAL NOTATION
UNIT I

ANSWERS TO TEST

1. a. four tenths
   b. eight tenths
   c. one hundredth
   d. seventy-three thousandths
   e. sixty hundredths
   f. one hundred fifty-one thousandths
   g. one and thirteen hundredths
   h. three hundredths
   i. three and five hundredths
   j. ten and seven tenths
   k. two hundred twenty-four thousandths
   l. two and twenty-five hundredths
   m. twenty-two hundredths
   n. eleven and three hundred four thousandths
   o. seven hundred nine thousandths

2. a. 0.5
   b. 0.70
   c. 0.362
   d. 0.830
   e. 5.006
   f. 3.48
   g. 0.978
   h. 13.60
   i. 0.005
   j. 0.010
   k. 14.833
   l. 9.083
   m. 68.582
   n. 40.004
   o. 137.238

ADDITION OF DECIMALS
UNIT II

UNIT OBJECTIVE

After completion of this unit, the student should be able to add decimal fractions. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by successfully scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit of instruction, the student will be able to:

1. Align given decimals into columns.
2. Add decimals.

ADDITION OF DECIMALS
UNIT II

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

  A. Objective sheet

  B. Information sheet

  C. Assignment sheets-

    1. Assignment Sheet #1--Align decimals for addition

    2. Assignment Sheet #2--Add decimals

  D. Answers to assignment sheets

  E. Test

  F. Answers to test

II. References

  A. Glenn, Euel D. and David H. Wiltsie. Success in Mathematics, Part I. Bishop, CA 93514: Motivation Development, Inc., 1981.

  B. Shea, James T. Basic Essentials of Math, Part I, 2nd Ed. Austin, TX 78768: Steck-Vaughn Co., 1980.

  C. Smith, Robert D. Applied General Mathematics. Albany, NY 12205: Delmar Publishing Co., 1983.

ADDITION OF DECIMALS
UNIT II

INFORMATION SHEET

I. Aligning Decimals

A. Align the numbers so that the decimal points are in a straight column.

Example: Add 38.2 + 2.05 + 36.007

(NOTE: Be sure that the tenths are lined with tenths, hundredths with hundredths, etc.)

$$\begin{array}{r@{.}l} 38&2\\ 2&05\\ 36&007\\ \hline \end{array}$$

B. Put the decimal point in the answer directly under the aligned decimal points.

Example:

$$\begin{array}{r@{.}l} 38&2\\ 2&05\\ 36&007\\ \hline & \end{array}$$

II. Adding Decimals--Add each column. Carry as in addition and record each answer in the column directly under each addend.

Example:

$$\begin{array}{r@{.}l} 38&2\\ 2&05\\ 36&007\\ \hline 76&257 \end{array}$$

ADDITION OF DECIMALS
UNIT II

ASSIGNMENT SHEET #1--ALIGN DECIMALS FOR ADDITION

Directions: Align the following numbers in columns for addition. Make sure the decimal points are aligned directly under one another. You do not need to add these problems.

Example: 15.2 + 3.06 = $\begin{array}{r@{.}l} 15 & 2 \\ +\ 3 & 06 \\ \hline \end{array}$

1. a. 330.2 + .05 =

b. 15.5 + 1.55 =

c. 1001.01 + 325 =

2. a. 5 + 3 + .2 =

b. 16.2 + 1 + .002 =

c. 18 + .22 + 101.4 =

3. a. 13.023 + .052 =

b. 1.037 + .01

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ADDITION OF DECIMALS
UNIT II

ASSIGNMENT SHEET #2--ADD DECIMALS

Directions: Add the following decimals, be sure to use a decimal point and remember to line up your decimal points when adding.

1. a. $\begin{array}{r} 0.2 \\ +0.7 \\ \hline \end{array}$ b. $\begin{array}{r} 0.9 \\ +0.8 \\ \hline \end{array}$ c. $\begin{array}{r} 0.6 \\ +\ 1.5 \\ \hline \end{array}$ d. $\begin{array}{r} 44.7 \\ +\ 23.3 \\ \hline \end{array}$

e. $\begin{array}{r} 0.184 \\ 0.045 \\ +0.001 \\ \hline \end{array}$ f. $\begin{array}{r} 0.007 \\ 0.004 \\ +0.003 \\ \hline \end{array}$ g. $\begin{array}{r} 5.78 \\ 3.45 \\ +\ 1.04 \\ \hline \end{array}$ h. $\begin{array}{r} 13 \\ 5.5 \\ +\ 6.37 \\ \hline \end{array}$

i. $\begin{array}{r} 0.37 \\ 5.05 \\ +\ 14 \\ \hline \end{array}$ j. $\begin{array}{r} 0.008 \\ 0.17 \\ +\ 7 \\ \hline \end{array}$ k. $\begin{array}{r} 0.019 \\ 5.6 \\ +\ 1.37 \\ \hline \end{array}$ l. $\begin{array}{r} 6.54 \\ 0.5 \\ 0.123 \\ +\ 13.01 \\ \hline \end{array}$

2. a. 0.04 + 0.18 =

b. 14 + 0.23 =

c. 1.41 + 2.32 + 5.39 =

d. 16.00 + 1.84 + 5.5 =

e. 1.038 + 5.047 + 6.1 =

f. 1.33 + 15.68 =

g. 15.07 + 16.123 =

h. 13 + 5.87 + 3.01 =

i. 1.07 + 6.1 + 7.63 + 8.4 =

j. 13.007 + 12.998 + 13.120 =

c. 13 + .508 =

4. a. 13.508 + 1.056 + .007 =

b. .7 + .08 + .158 +

c. 1 + .2 + 1.789 =

5. a. 100 + 58.007 + 238

b. 1.007 + 3.348 + 5.568 =

c. 18.384 + 5 + 199.667 =

ADDITION OF DECIMALS
UNIT II

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

1. a. 330.2
0.05

b. 15.5
1.55

c. 1001.01
325

2. a. 5
3
0.2

b. 16.2
1
0.002

c. 18
0.22
101.4

3. a. 13.023
0.052

b. 1.037
0.01

c. 13
0.508

4. a. 13.508
1.056
0.007

b. 0.7
0.08
0.158

c. 1
0.2
1.789

5. a. 100
58.007
238

b. 1.007
3.348
5.568

c. 18.384
5
199.667

ASSIGNMENT SHEET #2

1. a. 0.9
b. 1.7
c. 2.1
d. 68.0
e. 0.230
f. 0.014
g. 10.27
h. 24.87
i. 19.42
j. 7.178
k. 6.989
l. 20.173

2. a. 0.22
b. 14.23
c. 9.12
d. 23.34
e. 12.185
f. 17.01
g. 31.193
h. 21.88
i. 23.2
j. 39.125

ADDITION OF DECIMALS
UNIT II

TEST

Directions: 1) Align the following decimal numbers; 2) add them together.

a. 16.4 + 7.5 =

b. 2.56 + 8.27 =

c. 8.06 + 7 =

d. 21.8 + 7.668 =

e. 22.700 + 16.043 =

f. 320 + 84.664 + 116 =

g. 102.708 + 99.7 + 100 =

h. 609.385 + 29.004 + 516.56 =

i. 5.6 + 3.9 + 6.4 =

j. 9.2 + 6.2 + 0.5 =

k. 0.7 + 0.68 + 0.005 =

l. 10.56 + 11.1 + 13.066 =

m. 19.42 + 7.178 + 6.989 =

n. 17.01 + 31.193 + 21.88 + 39.125 =

ADDITION OF DECIMALS
UNIT II

ANSWERS TO TEST

1. Answers should have decimals aligned in a straight column.

2. a. 23.9
   b. 10.83
   c. 15.06
   d. 29.468
   e. 38.743
   f. 520.664
   g. 302.408
   h. 1154.949
   i. 15.9
   j. 15.9
   k. 1.385
   l. 34.726
   m. 33.587
   n. 109.208

SUBTRACTION OF DECIMALS
UNIT III

UNIT OBJECTIVE

After completion of this unit, the student should be able to subtract decimal fractions. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by successfully scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit of instruction, the student will be able to:

1. Align given decimals into columns.
2. Subtract decimals.

SUBTRACTION OF DECIMALS
UNIT III

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:
  A. Objective sheet
  B. Information sheet
  C. Assignment sheets-
    1. Assignment Sheet #1--Align decimals for subtraction
    2. Assignment Sheet #2--Subtract decimals
  D. Answers to assignment sheets
  E. Test
  F. Answers to test

II. References:
  A. Glenn, Euel D. and David H. Wiltsie. Success in Mathematics, Part I. Bishop, CA 93514: Motivation Development, Inc., 1981.
  B. Shea, James T. Basic Essentials of Math, Part I, 2nd Ed. Austin, TX 78768: Steck-Vaughn Co., 1980.

C. Smith, Robert D. Applied General Mathematics.
Albany, NY 12205: Delmar Publishing Co., 1983.

SUBTRACTION OF DECIMALS
UNIT III

INFORMATION SHEET--SUBTRACTION OF DECIMALS

I. Aligning Decimals--Align the numbers so that the decimal points are in a straight column

Example: 53.8 - 22.05   35.78 - 27.3

$$\begin{array}{r} 53.8 \\ \underline{-22.05} \end{array} \qquad \begin{array}{r} 35.78 \\ \underline{-27.3} \end{array}$$

(NOTE: Add zeros to make the place values the same. .8 and .80 are equal, and .3 and .30 are equal.)

Example:
$$\begin{array}{r} 53.8 \\ \underline{-22.05} \end{array} \text{ becomes } \begin{array}{r} 53.80 \\ \underline{-22.05} \end{array} \qquad \begin{array}{r} 35.78 \\ \underline{-27.3} \end{array} \text{ becomes } \begin{array}{r} 35.78 \\ \underline{-27.30} \end{array}$$

II. Subtracting Decimals--Subtract as with whole numbers, use borrowing if necessary

Example:
$$\begin{array}{r} 7\;10 \\ 53.\cancel{8}\cancel{0} \\ \underline{-22.05} \\ 31.75 \end{array}$$

1. Bring down decimal point into the answer.

2. 5 from 0 can't be done, so we borrowed 10 from the 8 leaving 7.

3. So, 10 minus 5 is 5, 7 minus 0 is 7, 3 minus 2 is 1, and 5 minus 2 is 3.

(NOTE: Be sure to record the decimal in the answer in the same place as in the problem. Keep the decimal column straight.)

III. Subtracting Whole Numbers and Decimals--Put a decimal to the right of the whole number and add enough zeros to complete the subtraction process

Example: 36 - .5 =
$$\begin{array}{r} 36.0 \\ \underline{-\ \ .5} \\ 35.5 \end{array}$$

1. Place decimal point to the right of the 6 in 36.

2. Place a zero to the right of the decimal point, because the .5 was one place to the right of the decimal point.
3. Do subtraction.

SUBTRACTION OF DECIMALS
UNIT III

ASSIGNMENT SHEET #1--ALIGN DECIMALS FOR SUBTRACTION

Directions: Align the following numbers in columns for subtraction. Make sure the decimal points are aligned directly under one another. You do not need to subtract these problems.

```
Example:  32 - 2.5 =  32.0
                     - 2.5
                     -----
```

1. a. 15.2 - 3.1 =

   b. 2.53 - 0.06 =

   c. 306.001 - 1.1 =

2. a. 30 - 0.2 =

   b. 15.801 - 2.3 =

   c. 135.8 - 6.40 =

3. a. 36 - 0.70

   b. 113.158 - 100.2 =

   c. 0.758 - 0.608 =

4. a. 99 - 0.207

   b. 0.978 - 0.38 =

   c. 1.532 - 0.807 =

SUBTRACTION OF DECIMALS
UNIT III

ASSIGNMENT SHEET #2--SUBTRACT DECIMALS

Directions: Do the following subtraction problems. Make sure you have the decimal points lined up.

Examples:

$$\begin{array}{r} 5.6 \\ -3.2 \\ \hline 2.4 \end{array} \qquad \begin{array}{r} 5.25 \\ -3 \\ \hline \end{array} = \begin{array}{r} 5.25 \\ -3.00 \\ \hline 2.25 \end{array} \qquad \begin{array}{r} 8 \\ -5.79 \\ \hline \end{array} = \begin{array}{r} 8.00 \\ -5.79 \\ \hline 2.21 \end{array}$$

1. a. $\begin{array}{r} 5.7 \\ -\ 2.3 \\ \hline \end{array}$ b. $\begin{array}{r} 0.28 \\ -0.17 \\ \hline \end{array}$ c. $\begin{array}{r} 5.08 \\ -\ 3.24 \\ \hline \end{array}$ d. $\begin{array}{r} 0.978 \\ -0.883 \\ \hline \end{array}$

e. $\begin{array}{r} 7.2 \\ -\ 5.9 \\ \hline \end{array}$ f. $\begin{array}{r} 5.70 \\ -0.34 \\ \hline \end{array}$ g. $\begin{array}{r} 28.25 \\ -\ 13.4 \\ \hline \end{array}$ h. $\begin{array}{r} 0.25 \\ -0.137 \\ \hline \end{array}$

i. $\begin{array}{r} 7.37 \\ -\ 5.2 \\ \hline \end{array}$ j. $\begin{array}{r} 18 \\ -\ 9.37 \\ \hline \end{array}$ k. $\begin{array}{r} 7.47 \\ -\ 6.138 \\ \hline \end{array}$ l. $\begin{array}{r} 0.047 \\ -0.03 \\ \hline \end{array}$

m. 17.58 - 16.39 = n. 138.05 - 87.31 =

o. 0.372 - 0.283 = p. 5.45 - 3.6 =

q. 13.2 minus 5.64 = r. 58.64 subtract 37.32 =

SUBTRACTION OF DECIMALS
UNIT III

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

1. a. $\begin{array}{r}15.2\\ \underline{-\ 3.1}\end{array}$

b. $\begin{array}{r}2.53\\ \underline{-0.06}\end{array}$

c. $\begin{array}{r}306.001\\ \underline{-\ 1.100}\end{array}$

2. a. $\begin{array}{r}30.0\\ \underline{-0.2}\end{array}$

b. $\begin{array}{r}15.801\\ \underline{-\ 2.300}\end{array}$

c. $\begin{array}{r}135.80\\ \underline{-\quad 6.40}\end{array}$

3. a. $\begin{array}{r}36.00\\ \underline{-0.78}\end{array}$

b. $\begin{array}{r}113.158\\ \underline{-\ 100.200}\end{array}$

c. $\begin{array}{r}0.758\\ \underline{-0.608}\end{array}$

4. a. $\begin{array}{r}99.000\\ \underline{-0.207}\end{array}$

b. $\begin{array}{r}0.978\\ \underline{-0.380}\end{array}$

c. $\begin{array}{r}1.532\\ \underline{-0.807}\end{array}$

ASSIGNMENT SHEET #2

1. a. 3.4
b. 0.11
c. 1.84
d. 0.095
e. 1.3
f. 5.36
g. 14.85
h. 0.113
i. 2.17
j. 8.63
k. 1.332
l. 0.017
m. 1.19
n. 50.74
o. 0.089
p. 1.85
q. 7.56
r. 21.32

SUBTRACTION OF DECIMALS
UNIT III

TEST

Directions: 1) Align the following decimals; 2) then subtract.

a. 6.3 - 2.7 =

b. 5.14 - 3.07 =

c. 0.568 - 0.373

d. 16.78 - 13.2 =

e. 37.2 - 28.8 =

f. 13.5 - 9.75 =

g. 0.78 - 0.135

h. 9.0 - 0.56 =

i. 110.001 - 0.5 =

j. 11 - .056 =

k. 19.500 - 17.8 =

l. 418.19 minus 80.73 =

m. 468.009 subtract 39.07 =

n. 13.000 minus 0.783 =

o. 0.46 subtracted from 0.464 =

SUBTRACTION OF DECIMALS
UNIT III

ANSWERS TO TEST

1. Answers should have decimals in a straight column.

2. a. $\begin{array}{r} 6.3 \\ -\ 2.7 \\ \hline 3.6 \end{array}$

b. $\begin{array}{r} 5.14 \\ -\ 3.07 \\ \hline 2.07 \end{array}$

c. $\begin{array}{r} 0.568 \\ -0.373 \\ \hline 0.195 \end{array}$

d. $\begin{array}{r} 16.78 \\ -\ 13.20 \\ \hline 3.58 \end{array}$

e. $\begin{array}{r} 37.2 \\ -\ 28.8 \\ \hline 8.4 \end{array}$

f. $\begin{array}{r} 13.50 \\ -\ 9.75 \\ \hline 3.75 \end{array}$

g. $\begin{array}{r} 0.780 \\ -0.135 \\ \hline 0.645 \end{array}$

h. $\begin{array}{r} 9.00 \\ -\ 0.56 \\ \hline 8.44 \end{array}$

i. $\begin{array}{r} 110.001 \\ -0.500 \\ \hline 109.501 \end{array}$

j. $\begin{array}{r} 11.000 \\ -0.056 \\ \hline 10.944 \end{array}$

k. $\begin{array}{r} 19.500 \\ -\ 17.800 \\ \hline 1.700 \end{array}$

l. $\begin{array}{r} 418.19 \\ -\ 80.73 \\ \hline 337.46 \end{array}$

m. $\begin{array}{r} 468.009 \\ -\ 39.070 \\ \hline 428.939 \end{array}$

n. $\begin{array}{r} 13.000 \\ -0.783 \\ \hline 12.217 \end{array}$

o. $\begin{array}{r} 0.464 \\ -0.460 \\ \hline 0.004 \end{array}$

MULTIPLICATION OF DECIMALS
UNIT IV

UNIT OBJECTIVE

After completion of this unit, the student should be able to multiply decimal fractions. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit of instruction, the student will be able to:

1. Multiply decimals by whole numbers.

MULTIPLICATION OF DECIMALS
UNIT IV

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

  A. Objective sheet

  B. Information sheet

  C. Assignment sheets-

    1. Assignment Sheet #1--Multiply whole numbers and decimals

  D. Answers to assignment sheets

  E. Test

  F. Answers to test

II. References:

  A. Glenn, Euel D. and David H. Wiltsie. Success in Mathematics, Part I. Bishop, CA 93514: Motivation Development, Inc., 1981.

  B. Shea, James T. Basic Essentials of Math, Part I, 2nd Ed. Austin, TX 78768: Steck-Vaughn Co., 1980.

  C. Smith, Robert D. Applied General Mathematics. Albany, NY 12205: Delmar Publishing Co., 1983.

MULTIPLICATION OF DECIMALS
UNIT IV

INFORMATION SHEET

I. Multiplying Decimals by Whole Numbers

(NOTE: You do not have to keep the decimals aligned in multiplication.)

A. Set up the problem with the number with the least number of digits on the bottom, as in whole number multiplication.

Example:
$$\begin{array}{r} 2.36 \\ \underline{\times\ 32} \end{array}$$

B. Multiply as with whole numbers, carrying if needed.

Example:
$$\begin{array}{r} 2.36 \\ \underline{\times\ 32} \\ 4\ 72 \\ \underline{70\ 8} \end{array}$$

C. Count the decimal places in the one number. Put the decimal in the answer the same number of places as the total decimal places in the problem, counting from the right to the left.

Example:
$$\begin{array}{r} 2.36 \\ \underline{\times\ 32} \\ 4\ 72 \\ \underline{70\ 8} \\ 75.52 \end{array}$$

In this case, there are two decimal places.

MULTIPLICATION OF DECIMALS
UNIT IV

ASSIGNMENT SHEET #1--MULTIPLY WHOLE NUMBERS AND DECIMALS

Directions: Multiply the following whole numbers and decimals. Remember to count the number of places from the right in the decimal number and then place your decimal point in the product(answer) that number of places.

```
Example:   15                        1.56   2 places
         x0.4   1 place              x 42
          6.0   1 place               312
          6.0   answer               624
                                     6552   2 places
                                    65.52   answer

            .007   3 places
            x 12
             014
            007
            0084   3 places
           0.084   answer
```

```
1.  a. 0.5      b. 0.7        c. 0.13       d.  0.12
        x8         x12           x  0           x 12


    e.  1.58    f.  8.5       g.  56.3      h. 0.123
       x 123       x 65          x 36           x 16


    i. 0.008    j. 0.789      k. 0.87       l.   7.4
         x 9      x 1000        x 100         x 180
```

2. a. 33 x 0.33

b. 0 x 0.45

c. 73 times 0.503

d. 5 x 1.68 =

e. 38 x 0.002

f. 4 multiply 13.03 =

MULTIPLICATION OF DECIMALS
UNIT IV

ANSWERS TO ASSIGNMENT SHEET #1

1. a. 4
   b. 8.4
   c. 0
   d. 1.44
   e. 194.34
   f. 552.5
   g. 2026.8
   h. 1.968
   i. 0.072
   j. 789
   k. 87
   l. 1332

2. a. 10.89
   b. 0
   c. 36.719
   d. 8.4
   e. 0.076
   f. 52.12

MULTIPLICATION OF DECIMALS
UNIT IV

TEST

Directions: Multiply the following whole numbers and decimals.

1. a. 0.13
   x 52

   b. 0.153
   x 21

   c. 142
   x 1.7

   d. 123
   x0.13

   e. 0.23
   x 45

   f. 25
   x 0.5

   g. 32
   x 1.5

   h. 0.731
   x 458

   i. 52 times 0.3 =

   j. 0.13 multiplied by 7 =

   k. 25.2 x 13 =

   l. 0 times 0.1 =

   m. 127 x 0.5 =

n. 0.12 x 100 =

o. 1.321 multiplied by 40 =

p. 84 x 5.002 =

MULTIPLICATION OF DECIMALS
UNIT IV

ANSWERS TO TEST

1.
   - a. 6.76
   - b. 3.213
   - c. 241.4
   - d. 15.99
   - e. 10.35
   - f. 12.5
   - g. 48
   - h. 334.798
   - i. 15.6
   - j. 0.91
   - k. 327.6
   - l. 0
   - m. 63.5
   - n. 12
   - o. 52.84
   - p. 420.168

DIVISION OF DECIMALS
UNIT V

UNIT OBJECTIVE

After completion of this unit, the student should be able to divide decimal fractions. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit of instruction, the student will be able to:

1. Divide decimals by whole numbers.

DIVISION OF DECIMALS
UNIT V

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:

A. Objective sheet

B. Information sheet

C. Assignment sheets-

1. Assignment Sheet #1--Division of Decimals

D. Answers to assignment sheets

E. Test

F. Answers to test

II. References

A. Glenn, Euel D. and David H. Wiltsie. Success in Mathematics, Part I. Bishop, CA 93514: Motivation Development, Inc., 1981.

B. Shea, James T. Basic Essentials of Math, Part I, 2nd Ed. Austin, TX 78768: Steck-Vaughn Co., 1980.

C. Smith, Robert D. Applied General Mathematics. Albany, NY 12205: Delmar Publishing Co., 1983.

DIVISION OF DECIMALS
UNIT V

INFORMATION SHEET

I. Dividing Decimals by Whole Numbers

A. Set up the problem as in division of whole numbers.

Example: 36.2 divided by 2

$$2/\overline{36.2}$$

B. Place the decimal in the answer, directly above the decimal in the dividend.

Example: $2/\overline{.}$
36.2

$$2/\overline{\overset{.}{36.2}}$$

C. Divide as with whole numbers.

Example:

$$
\begin{array}{rr}
 & 18.1 \\
2/ & \overline{36.2} \\
 & \underline{-2} \\
 & 16 \\
 & \underline{-16} \\
 & 2 \\
 & \underline{-2} \\
 & 0
\end{array}
$$

DIVISION OF DECIMALS
UNIT V

ASSIGNMENT SHEET #1--DIVIDE DECIMALS BY WHOLE NUMBERS

Directions: Divide out the following problems. Bring the decimal point directly above its location into the quotient (answer), and divide like you would an ordinary division problem.

Examples:

```
      1.36              .05
   5/ 6.80          11/ .55
     -5                -55
      1 8                0
     -1 5
        30
       -30
         0
```

1. a. 3/ 2.7   b. 8/ 5.28   c. 7/0.889

d. 100/ 5.34   e. 13/0.0546   f. 3/0.0531

g. 2/0.7   h. 16/ 7.   i. 18/ 15.84

j. $53\overline{)17.013}$ k. $17\overline{)957.1}$ l. $9\overline{)37.08}$

2. a. 35.34 ÷ 3 =

   b. 13.431 ÷ 11 =

   c. 12.36 ÷ 12 =

   d. 1.745 ÷ 5 =

   e. 7.476 ÷ 21 =

   f. 1.455 ÷ 3 =

DIVISION OF DECIMALS
UNIT V

ANSWERS TO ASSIGNMENT SHEET #1

1. a. 0.9
   b. 0.66
   c. 0.127
   d. 0.0534
   e. 0.0042
   f. 0.0177
   g. 0.35
   h. 0.4375
   i. 0.88
   j. 0.321
   k. 56.3
   l. 4.12

2. a. 11.78
   b. 1.221
   c. 1.03
   d. 0.349
   e. 0.356
   f. 0.485

DIVISION OF DECIMALS
UNIT V

TEST

1. Divide out the following problems:

a. $2/\overline{1.56}$

b. $5/\overline{0.055}$

c. $8/\overline{16.32}$

d. $16/\overline{5.024}$

e. $100/\overline{13.3}$

f. $32/\overline{41.6}$

g. $25/\overline{0.95}$

h. $24/\overline{7.992}$

i. $6.3 \div 14 =$

j. 0.056 ÷ 8 =

k. 1.56 divided by 3 =

l. 1.5 divided by 12 = 283

DIVISION OF DECIMALS
UNIT V

ANSWERS TO TEST

1. a. 0.78
   b. 0.011
   c. 2.04
   d. 0.314
   e. 0.133
   f. 1.3
   g. 0.038
   h. 0.333
   i. 0.45
   j. 0.007
   k. 0.52
   l. 0.125

MIXED COMPUTATION OF DECIMALS
UNIT VI

UNIT OBJECTIVE

After completion of this unit, the student should be able to compute decimal fractions. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by scoring 85 percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit of instruction, the student will be able to:

1. Define the operation needed to solve a given decimal problem as indicated by a symbol or term.
2. Solve a given decimal problem by using the addition, subtraction, multiplication, or division operation indicated by symbol or term.

MIXED COMPUTATION OF DECIMALS
UNIT VI

SUGGESTED ACTIVITIES

I. Provide student with objective sheet.

II. Provide student with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Assist students as they work through assignment sheets.

VI. Give test.

VII. Evaluate and record test results.

INSTRUCTIONAL MATERIALS

I. Included in the unit:
  - A. Objective sheet
  - B. Information sheet
  - C. Assignment sheets-
    1. Assignment Sheet #1--Match operation to symbol or term.
    2. Assignment Sheet #2--Solve mixed computation of decimals
  - D. Answers to assignment sheets
  - E. Test
  - F. Answers to test

II. References
  - A. Glenn, Euel D. and David H. Wiltsie. Success in Mathematics, Part I. Bishop, CA 93514: Motivation Development, Inc., 1981.

B. Shea, James T. Basic Essentials of Math, Part I, 2nd Ed. Austin, TX 78768: Steck-Vaughn Co., 1980.

C. Smith, Robert D. Applied General Mathematics. Albany, NY 12205: Delmar Publishing Co., 1983.

MIXED COMPUTATION OF DECIMALS
UNIT VI

INFORMATION SHEET

I. Terms and Definitions

A. Addition--Combining together, indicated by the symbol + or by terms such as plus, add, find the sum, or find the total.

B. Subtraction--Taking away, indicated by the symbol - or by terms such as subtract, minus, take away, or find the difference.

C. Multiplication--Combining like numbers quickly, indicated by the symbol x, or by terms such as times, multiply or find the product; also symbolized by use of parentheses ( )( ) or by a raised dot .

D. Division--Separating into equal-sized groups, indicated by the symbols ÷ or $\overline{)}$, or by terms such as divided by or find the quotient.

II. Procedures

A. Determine operational symbol or word.

B. Apply operational procedure.

(NOTE: Addition and subtraction of decimals require alignment of decimal points into straight columns. Multiplication and division do not require decimal alignment.)

MIXED COMPUTATION OF DECIMALS
UNIT VI

ASSIGNMENT SHEET #1--MATCH OPERATION TO SYMBOL OR TERM.

Directions: Fill in the blank with the operation (addition, subtraction, multiplication or division) indicated by the terms or symbols in the first column.

Example: + Addition

1. a. ÷ ____________________

   b. find the difference ____________________

   c. find the sum ____________________

   d. x ____________________

   e. find the total ____________________

2. a. product ____________________

   b. plus ____________________

   c. quotient ____________________

   d. minus ____________________

   e. divided by ____________________

MIXED COMPUTATION OF DECIMALS
UNIT VI

ASSIGNMENT SHEET #2--SOLVE MIXED COMPUTATIONAL DECIMAL PROBLEMS.

Directions: Decide which operation is indicated in each of the following problems. Use the indicated operation to solve the problem.

1. a. $\begin{array}{r} 3.6 \\ -\ 1.08 \\ \hline \end{array}$ b. $\begin{array}{r} 3.6 \\ \times\ 4 \\ \hline \end{array}$ c. $\begin{array}{r} 3.65 \\ +\ 4.23 \\ \hline \end{array}$ d. $3\overline{)6.18}$

2. a. 6.2 times 5 =

b. 82.3 minus 15.46 =

c. 105.83 plus 21.6 =

d. Find the difference between 32.46 and 15.5_______

e. Find the product of 15 and 2.3_________

f. Find the sum of 33.82 and 15.4_________

g. Find the quotient of 15.5 ÷ 5_________

MIXED COMPUTATION OF DECIMALS
UNIT VI

ANSWERS TO ASSIGNMENT SHEETS

ASSIGNMENT SHEET #1

1. a. division
   b. subtraction
   c. addition
   d. multiplication
   e. addition

2. a. multiplication
   b. addition
   c. division
   d. subtraction
   e. division

ASSIGNMENT SHEET #2

1. a. 2.52
   b. 14.4
   c. 7.88
   d. 2.06

2. a. 31
   b. 66.84
   c. 127.43
   d. 16.96
   e. 34.5
   f. 49.22
   g. 3.1

MIXED COMPUTATION OF DECIMALS
UNIT VI

TEST

Directions: 1) Decide which operation to use; 2) then solve the problem.

		1. Operation	2. Solution
a.	Find the difference between 13.8 and 9.7		
b.	1.34 times 13		
c.	Total 1.356, 18.56, and 21.2		
d.	11.59 plus 21.72		
e.	Find the quotient of 13.35 ÷ 15		
f.	Find the product of 16 and 0.434		
g.	79.4 minus 37.56		
h.	Find the sum of 0.079 and 1.016		
i.	$24\overline{)8.76}$		
j.	15.9 multiplied by 50		
k.	Find the total of 1.567, 2.036, and 4.187		
l.	Subtract 13.7 from 24.3		
m.	0.532 take away 0.278		
n.	Find the product of 18 and 0.123		
o.	Find the difference between 3.009 and 2.784		

MIXED COMPUTATION OF DECIMALS
UNIT VI

ANSWERS TO TEST

1. Operation		2. Solution	
a.	-	a.	4.1
b.	x	b.	17.42
c.	+	c.	41.116
d.	+	d.	33.31
e.	÷	e.	0.89
f.	x	f.	6.944
g.	-	g.	41.84
h.	+	h.	1.095
i.	÷	i.	0.365
j.	x	j.	795
k.	+	k.	7.790
l.	-	l.	10.6
m.	-	m.	0.254
n.	x	n.	2.214
o.	-	o.	0.225